Mariners Weather Log

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Monitoring the Arctic Ocean: The International Arctic Buoy Program, Page 4

Image courtesy of D.G. Barton, USCG, (Ret.)

Mariners Weather Log

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Hello once again from the wonderful world of VOS. Since the hectic election season is behind us, we now are focused on getting ready for a busy holiday season. Its time to enjoy the hustle & bustle of shopping for that perfect gift, songs melodiously dancing in your head, quality time with the family, and trying not to burn the rolls and upsetting your mother in law. At least the extinguisher was handy & the Chinese restaurant was still open. Sorry, that is a story for another day; but let's just say that someone is still exiled from the kitchen to this day.

These past few months have also been busy ones for the Mariners Weather Log (MWL) as well. Due to the intense tropical season, especially in Florida, the National Hurricane Center could not submit a Tropical Weather Review article for this issue. I am being promised that the next article for the April issue will be well worth the wait. At least we have some other great stories to share in this issue. The National Ice Center offers us a great article about the Arctic Buoy program, and the good folks at Amver help to explain life behind the Blue and White flag. The Meteorological Services of Canada shares their experiences with the "Great Waterspout Outbreak", and there's a story about the use of satellites to detect rogue waves. We also welcome our newest PMO onboard so be sure to read the biography about Ms Peggy Alander down in sunny Port Everglades, Florida.

Once again, I hope you enjoy this offering of the MWL so find a nice comfortable spot to hunker down in and start relaxin'.

Regards – Luke ⚓

Some Important Web Page Addresses

NOAA	http://www.noaa.gov
National Weather Service	http://www.nws.noaa.gov
National Data Buoy Center	http://www.ndbc.noaa.gov
AMVER Program	http://www.amver.com
VOS Program	http://www.vos.noaa.gov
SEAS Program	http://seas.nos.noaa.gov/seas/
Mariners Weather Log	http://www.vos.noaa.gov/mwl.shtml
Marine Dissemination	http://www.nws.noaa.gov/om/marine/home.htm
U.S. Coast Guard Navigation Center	http://www.navcen.uscg.gov/marcomms/

See these Web pages for further links.

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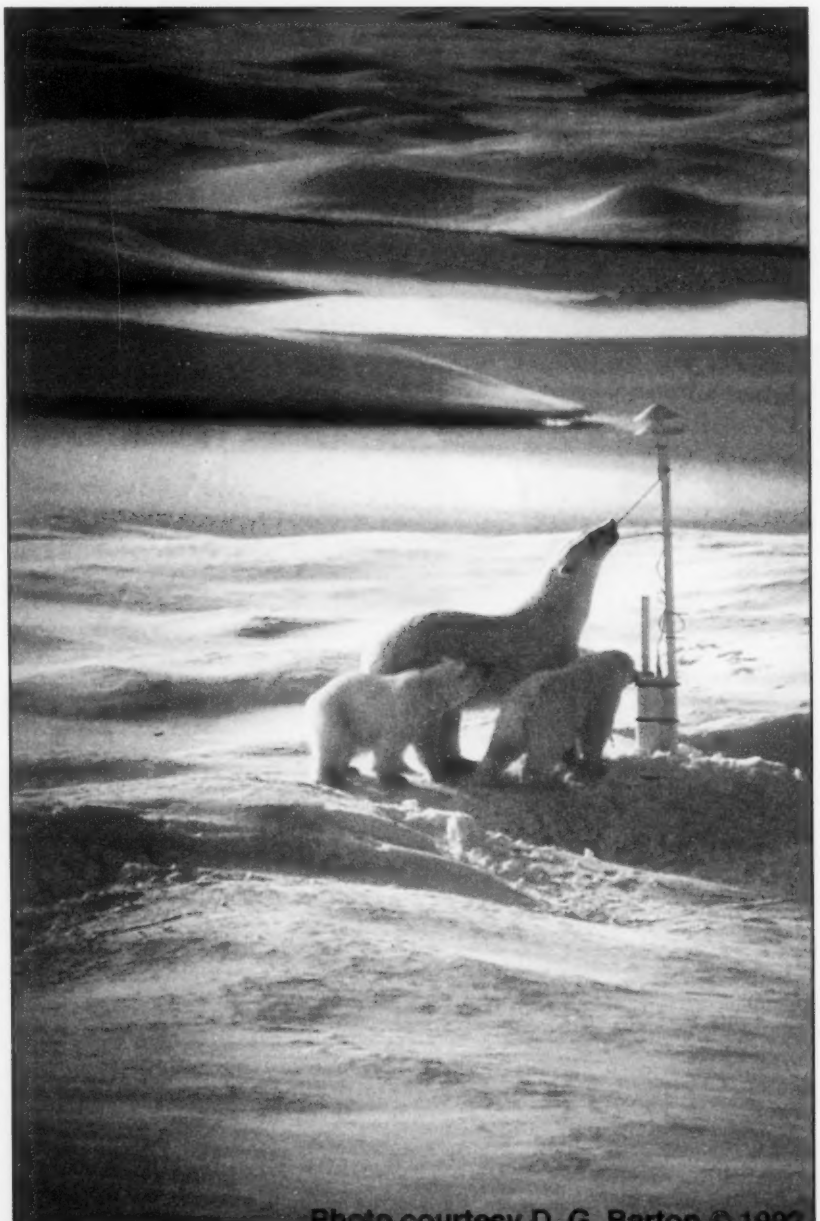
Monitoring the Arctic Ocean: The International Arctic Buoy Program

ENS Bryan Wagonseller, NOAA and LT Magda Hanna, USN, National Ice Center, Washington, DC

Characterized by its unrelenting cold weather and partially frozen surface, the Arctic Ocean is one of the world's smallest oceans and one of the most dynamic in terms of climate. In order to understand more about the oceanic processes and properties that prevail in the Arctic Ocean, the International Arctic Buoy Program (IABP) has made it an objective to establish and maintain a network of data buoys drifting on the sea ice of the Arctic Ocean. The purpose of these data buoys is to provide meteorological and oceanographic data for real-time operational requirements and research purposes (http://iabp.apl.washington.edu/Principles.htm).

The IABP is a collaborative effort by domestic and international research agencies and organizations to monitor sea level pressure, surface air temperature, ice motion, and other geophysical variables. The United States' contribution to the IABP is coordinated through the United States Interagency Arctic Buoy Program (USIABP), which is managed by the National Ice Center (NIC). The USIABP is also a collaborative effort, drawing operating funds and services from a number of government organizations and research programs within the U.S. Among them are the International Arctic Research Center at the University of Alaska Fairbanks, the National Aeronautics and Space Administration, the NIC, the National Oceanic and Atmospheric Administration (NOAA), the National Science Foundation, the Naval Oceanographic Office, the Naval Research Laboratory, the Office of



Because the arctic buoys are such an out-of-the-ordinary sight on the Arctic Ocean, their presence draws the attention of these curious polar bears.

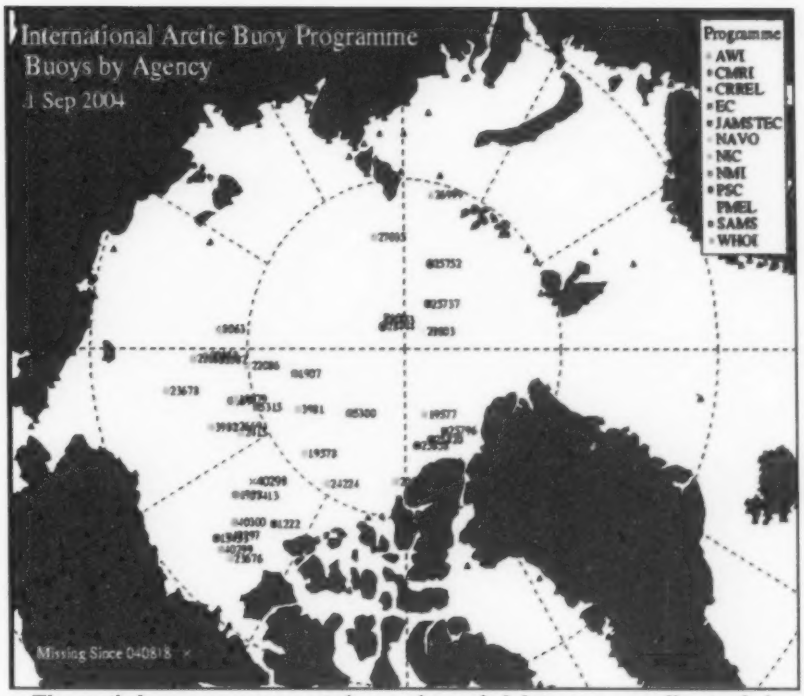
Photograph courtesy of D.G. Barton, USCG (Ret.)

Naval Research, and the U.S. Coast Guard.

Since 1979, an average of 25 buoys per year have been deployed at different locations in the Arctic Ocean. By tracking each buoy, data can be retrieved about the buoy's movement and how the pressure and temperature changes over time. This network of buoys allows one to get the bigger picture of Arctic climate conditions throughout the year, which is valuable for forecasting Arctic weather and climate research. The position and data from the buoys are collected through the Argos Data Collection System, incorporated into the NOAA Polar-orbiting Operational Environmental Satellites (POES) system (http://noaasis.noaa.gov/ARGOS).

The funding for the network of buoys comes from a variety of sources, all of which have interests in the study of Arctic climatology. About 25 to 30 buoy deployments are needed per year to maintain the network at its current number. The USIABP contributes an average of 10 buoy deployments per year. The international community, represented by 7 other countries, contributes the funds to produce the rest of the buoys. The buoys are deployed by such platforms as icebreakers and U.S. Navy P-3 aircraft, making the logistics of transportation relatively easy to manage. Once the buoys are deployed, they begin work by transmitting the data they collect at their respective locations. Each buoy has a life span of approximately 2 years. However, the buoys are susceptible to sinking in the event of ice melting, which makes the yearly replenishment vital to the health of the network.

The success of the IABP is evident by the number of publications produced as a result of the observations made by the buoys.



The arctic buoys are represented as cvolor-coded dots corresponding to their respective contributors

Chart provided courtesy of IABP http://iabp.apl.washington.edu/owners.html

(http://iabp.apl.washington.edu/Citations) The IABP is coordinated by Ignatius Rigor at the Polar Science Center, a division of the Applied Physics Laboratory at the University of Washington (http://psc.apl.washington.edu) and LT Magda Hanna at the NIC manages the USIABP.

The NIC is a unique national asset and a successful model of a Joint Interagency Command consisting of the U.S. Navy, NOAA, and U.S. Coast Guard personnel. The NIC's mission is to provide global, regional and tactical scale sea ice analyses and forecasts for a variety of customers. Please visit the National Ice Center webpage (http://www.natice.noaa.gov) for more information or contact the NIC Liaison Officer, ENS Bryan Wagonseller at liaison@natice.noaa.gov or (301) 394-3100. ⚓

Contributor Biographies:

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LT Magda Hanna is Transitions Officer for the Science and Applied Technology Department of the National/Naval Ice Center in Washington, DC. She is an active duty member of the United States Navy. Her previous assignment with the U.S. Navy included serving as Electrical Officer and Assistant Navigator aboard the USS HIGGINS (DDG 76), San Diego, CA.

The Great Waterspout Outbreak of 2003

Wade Szilagyi, Program Manager Meteorologist, Meteorological Service of Canada, Toronto

A family of four waterspouts over Lake Huron near Kincardine, Ontario, Canada on 9 September, 1999.

Photo courtesy of L. Glover

Abstract

The period from 27 September to 3 October 2003 saw the largest waterspout outbreak over the Great Lakes in recorded history. In total, an unbelievable 66+ waterspouts were sighted! On one day alone, 21+ waterspouts were seen over Lake Ontario. One confirmed waterspout even made it to land, causing some shoreline damage. The outbreak period was 7 days, making it the longest lasting event. It was also the most photographed event with 67 photographs and 3 videos taken. The event was recognized well in advance; being forecasted 4 days ahead of time. The event's contribution to the year's total of 82 waterspouts was a record in itself. This was the largest number of waterspouts ever recorded in any year over the Great Lakes. An interesting fact is that if the event had not taken place, the 2003 waterspout season would have turned out to be the lowest on record.

This record-breaking event can be attributed to a cold air mass, with an associated major upper trough, which moved over the Great Lakes, remaining entrenched there for an entire week. Lake temperatures were also well above normal for that time of year. This combination turned the Great Lakes into a "natural laboratory" that generated multiple vortices on a daily basis.

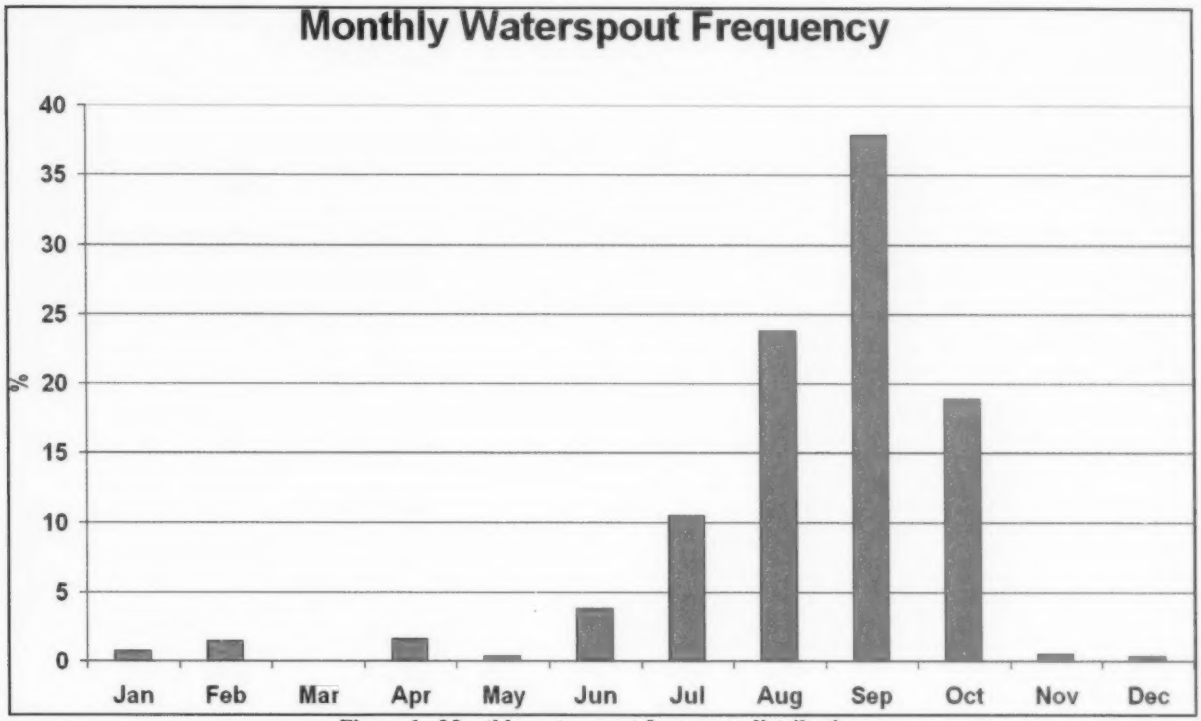


Figure 1. Monthly waterspout frequency distribution.

Introduction

September is the peak month for waterspout activity over the Great Lakes (***Figure 1)***. During this period an average of 15 waterspouts are usually sighted. However, up until the last few days of September 2003, only 6 sightings were reported. As with the year before, it looked like there would be little in the way of waterspouts.

The water temperatures of the Great Lakes were well above average for that time of year. This was as a result of a warmer than average summer that the region experienced. Interesting enough, warm water temperatures are one of the favourable conditions for waterspout development, yet few occurred. The same pattern was also seen the previous year with water temperatures well above normal, but with waterspout sightings well below the average. The reason for this was that the main jet stream was well to the north of the Great Lakes. As a result, few cold air outbreaks occurred. This meant that conditions were generally stable over the Great Lakes. Stable conditions are not conducive to waterspout development (See section on "Atmospheric stability"). However, things were to change in the last days of September 2003.

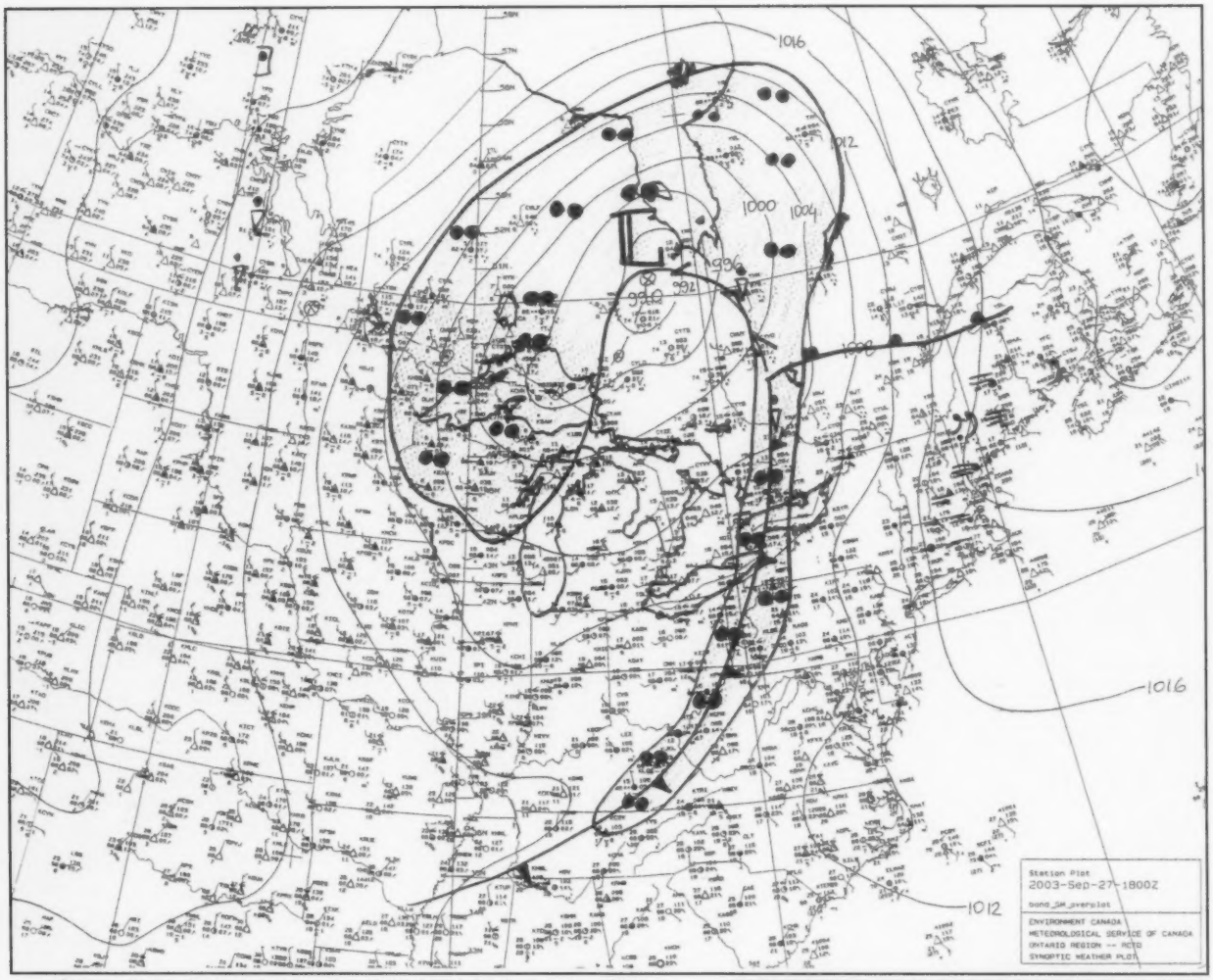


Figure 2. Surface synoptic map. 1800 UTC 27 September 2003.

Synoptic Situation

The onset of the outbreak was brought on by the flood of cold air in the wake of the passage of a cold front (***Figure 2***). This cold front would be the last major surface synoptic feature that the region would see until the end of the outbreak period 7 days later. Also present, was an exiting surface low over northeastern Ontario. Farther to the west, to the lee of the Rockies, a major northwest to southeast ridge was building in. This ridge would be responsible for developing the "Pipeline to the Arctic", which is a stream of cold air whose source is over the Arctic region. In the upper atmosphere, a major trough established itself over the region (***Figure 3***), remaining there for the next week.

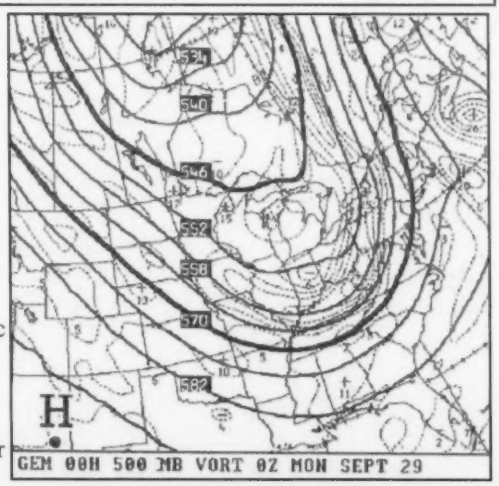


Figure 3. Regional GEM 00hr 500hPa height/vorticity map. 0000 28 September 2003

The outbreak period would also see the set up of several lines of showers and embedded thunderstorms over the Great Lakes (***Figure 4***). It was along these convergent lines that the majority of waterspouts were sighted. On October 1, one convergent line produced more than 12 waterspouts. Of these, 7 in a row were seen at the same time!

On October 2, an interesting event took place over eastern Lake Ontario. A northeast to southwest convergent line of showers and embedded thunderstorms had set up. At the same time, a northeast to southwest oriented surface trough was moving southward from Ontario over the lake. When the two features interacted, the convergent line intensified on radar (***Figure 4***). It was during this period that over 21 waterspouts were sighted!

The last day of this historic event occurred on October 3. By this time, the axis of the upper trough had moved off to the east of the Great Lakes. Also, warm air was moving into the region. This was in association with an approaching system from central Ontario. By October 4, conditions stabilized enough over the Great Lakes that no further waterspout sightings were reported.

Atmospheric stability

The passage of the cold front on September 27 resulted in a flood of cold air over the above seasonally warm waters of the Great Lakes. This resulted in unstable atmospheric conditions that would last for a week. The instability increased each day, reaching a peak on the days of October 1 and 2. On October 2, conditions were extremely unstable over Lake Ontario. On that day, clouds generated over the water reached 6,000 metres. A technique to forecast waterspouts, developed by the author, indicated that conditions were extremely favourable for waterspouts. More than 21 waterspouts formed along a convergent line on that day (***Figures 4 and 5a***)!

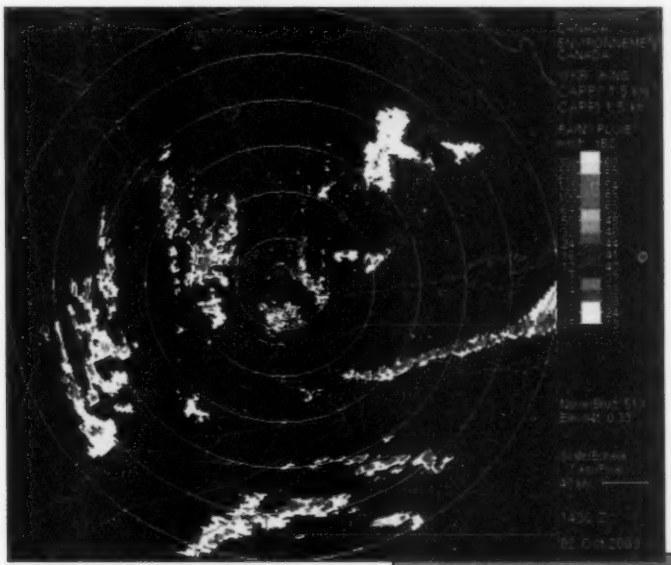


Figure 4. (above) CAPPI 1.5 km King radar. 1430 UTC 2 October 2003

Figure 5a (right). A photograph of one of the 21 waterspouts that formed along a convergent line over eastern Lake Ontario on October 2.
Photo courtesy of L. Glover.

Figure 5b (right). A thunderstorm that developed along the same convergent line.
Photo courtesy of S. Steiger

This same line also contained embedded thunderstorms (***Figure 5b***). Graupel (a form of frozen precipitation consisting of snowflakes or ice crystals and supercooled water droplets frozen together) were also observed from this line as it moved onshore (***Figure 5c***).

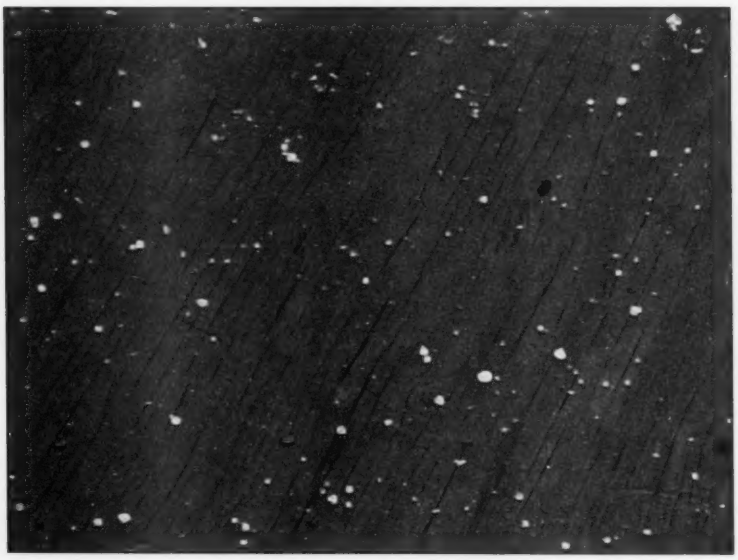


Figure 5c (left). Graupel produced from one of the convective clouds along the convergent line.
Photo courtesy of S. Steiger.

Acquisition of reports

The importance of networking for gathering reports cannot be overstated. Without the networking that took place during the outbreak, the total number of confirmed waterspout sightings would not have resulted in a record-breaking event. With networking, the total number of waterspouts confirmed was 66+. Without networking, the number would have been only 23+!

Meteorologists are usually informed of waterspouts from a variety of sources such as ships, aircraft, weather watchers, Coast Guard, and the general public. Previous to 1994, little communication took place between weather offices with regards to the sighting of waterspouts. In 1994, the author initiated a waterspout research project; this resulted in the establishment of a networking process. This process opened up the lines of communication between weather offices from around the Great Lakes. When a report of a waterspout was received at a weather office, the weather centre in Toronto was notified. All waterspout reports from every weather office from around the Great Lakes were then compiled at this central location. Immediately, there was a dramatic increase in the number of confirmed waterspout sightings (***Figure 6***).

During the Outbreak of 2003, this networking process was enhanced by actively pursuing reports from secondary and tertiary sources. These new sources of information included students from Oswego College in NY, a helicopter traffic reporter from Cleveland, storm chasers from Ontario, Canada and New York, Ontario Parks staff, and private individuals.

Another enhancement to the networking process was the direct coordination with a storm chaser during the entire event. This individual dedicated each day to seeking out and reporting on any waterspouts. The individual was contacted on a daily basis and directed to the most probable location of waterspout development within his area. It is through these efforts that 7 additional waterspout reports were added to the total for the entire event.

Event Predictability

The first hint that a major waterspout event was to take place was 5 days in advance of the event itself. At that time, the Canadian 120 hour Global Weather Model depiction showed that a major upper trough was to establish itself over the region.

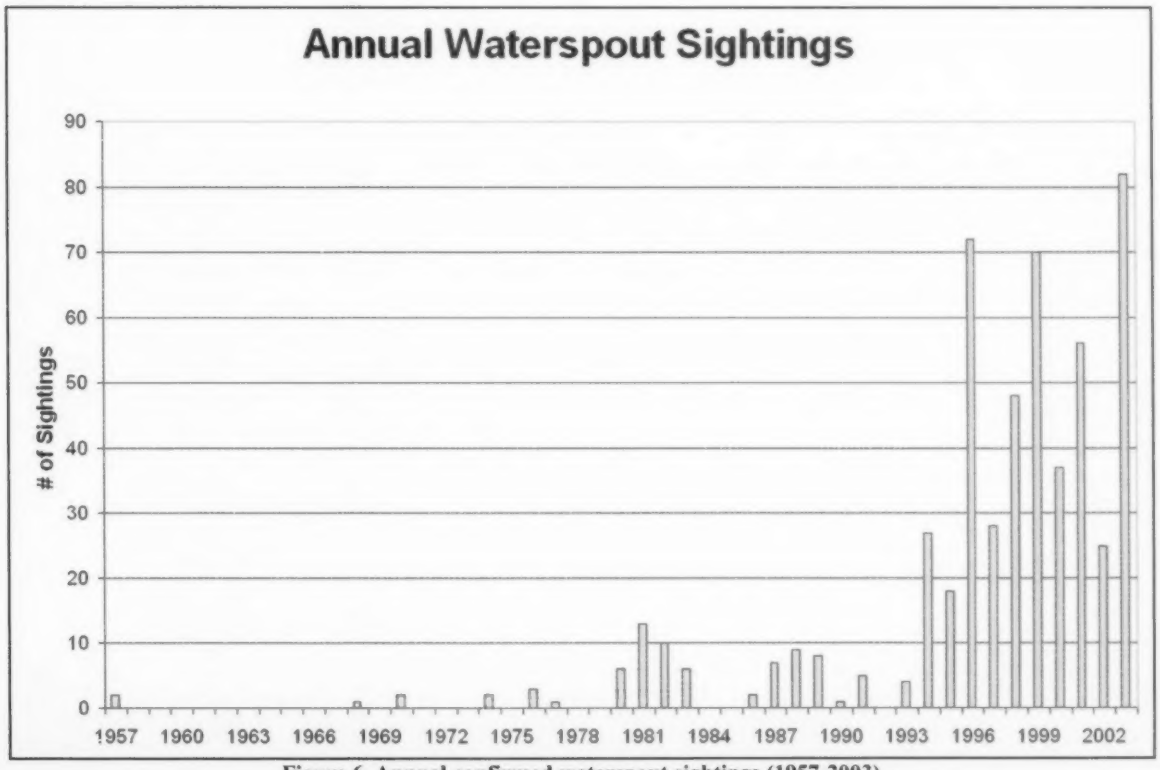


Figure 6. Annual confirmed waterspout sightings (1957-2003).

	1996	2003
# of Waterspouts	41	**66+**
Max. 1-day total	26	21+
Max. sighted at one time	8	7
Lead Time	0 hours	**4 days**
Outbreak Period	6 days	7 days
Pictures	0	**67**
Video	0	3
Storm Chasers Involved	0	6

Table 1. A summary of the record-breaking waterspout outbreak of 2003 and a comparison with the last major outbreak that took place in 1996.

However, before this would occur, a smaller waterspout event was to take place.

On September 23, 4 days before the event, a change in air mass occurred with the passage of a cold front. An associated upper trough also moved over the region. The waterspout technique had predicted 2 days in advance that favourable conditions would exist for the formation of waterspouts. This is indeed what took place, with 2 waterspouts being sighted off of Lake Erie. Still on September 23, the Global Weather Model continued to indicate that a major upper trough was to move into the region starting on September 27. The model also indicated that this air mass would be even colder than the one associated with the waterspout event on September 23. Based on this evidence, it was concluded that a major waterspout outbreak would occur. This was 4 days in advance of the event!

On September 25, 2 days before the event, evidence of a major outbreak was even stronger when the waterspout technique indicated favourable conditions for waterspouts. Finally, on September 26, waterspouts were mentioned in meteorological discussion bulletins and included in the marine forecast for Lake Michigan the next day.

Event Summary

A summary of the record-breaking event as well as a comparison with the last major outbreak is given in ***Table 1.***

What stands out in the comparison between the two major events is that the lead-time for predicting such events has improved dramatically over the past 7 years. Also, photographic evidence of such events has improved.

Figure 7 shows the spatial distribution of waterspout sightings over the Great Lakes during the record outbreak. It can be seen that the majority of the sightings occurred over Lakes Erie and Ontario. This was partly due to the geometric shape of each lake that allowed for convergent lines to set up. The other factor was that the events took place in a region where the population density was relatively high. Also, most sightings took place near communities. It should be noted that many convergent lines were observed on radar over Lake Huron and Georgian Bay (***Figure 4***). However, only 2 sightings were made from these areas during the entire outbreak period. This is an area of low population density. Waterspouts had likely occurred here as well.

To understand the scale of this historic event, a comparison must be made with a typical waterspout outbreak. Typically waterspout outbreaks last for about 24 hours with 5 waterspouts being sighted. The Great Outbreak of 2003 lasted almost 7 times longer than an average outbreak period. It also produced just over 13 times the number of waterspouts that would normally occur.

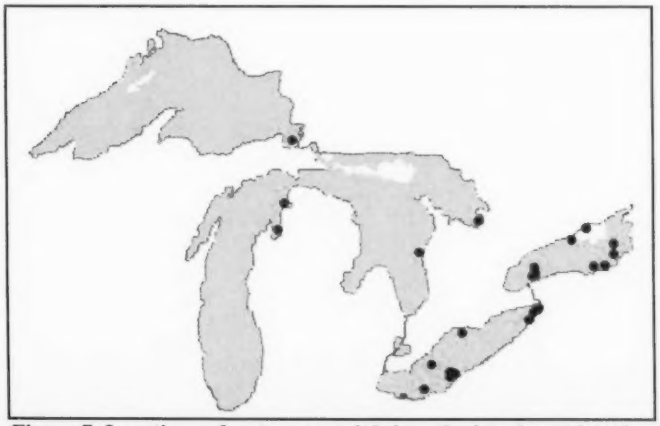


Figure 7. Locations of waterspout sightings during the outbreak (27 September–3 October 2003). Note that some location points had multiple sightings.

Conclusion

The Great Waterspout Outbreak of 2003 occurred due to a significant change in the upper air pattern that resulted in the movement of a cold air mass over the unseasonably warm waters of the Great Lakes. This created more than favourable conditions for waterspout formation that would last up to a week. The key to the longevity of the event was the entrenched major upper trough over the Great Lakes and the continuous supply of cool air from the Arctic region.

Atmospheric conditions were ideal for a record-breaking waterspout event to take place. However, there was a non-meteorological component that allowed for the confirmation of so many waterspout sightings resulting in such a record. This was the process of networking which took place within and outside the meteorological community. Without this process, which was developed during and after the event, the total number of confirmed waterspout sightings would have been far less. This networking process resulted in at least 43 additional waterspout reports!

Networking was so successful that a program called "The Waterspout Watch Program" will be developed in the near future. The program will consist of establishing a reporting mechanism that will notify various contacts from around the Great Lakes region when the potential for waterspouts will occur. These contacts will try to confirm any waterspouts during this period and report back to a central information managing authority.

Waterspout research has lead to a significant improvement in our understanding and ability to forecast waterspout events since 1994. There is no doubt that this trend will continue in the future. The establishment of the Waterspout Watch Program, improvements to the waterspout technique, and greater weather pattern recognition of waterspout outbreaks will ensure an improved level of skill in forecasting such events in the future.

Acknowledgements

Special thanks to Tom Niziol (Buffalo Weather Office) and Jack Kertzie (U.S. storm chaser) for going out of their way to observe and photograph waterspouts off of Lakes Erie and Ontario. I would also like to thank Rob Kuhn (Ontario Storm Prediction Centre), James Kosarik (Cleveland Weather Office), Steve Rowley (Gaylord Weather Office), David Andersen (The Plain Dealer) and Paul Vanderploeg (WTAM radio Cleveland) for supplying me with additional waterspout sighting information. Finally, special thanks to students Tracey Juda and Lance Glover as well as Prof. Scott Steiger of Oswego College for sending pictures and video. ⚓

Glossary

Upper trough–An elongated area of low atmospheric pressure which is generally located above 1500 m.

Surface trough–An elongated area of low atmospheric pressure which is generally located below 1500 m.

Jet stream–A relatively narrow band of high-speed winds, generally greater than 50 KT, found in the upper troposphere above regions of strong horizontal temperature contrasts such as fronts.

Cold air outbreak–An invasion of cold air over an area. Associated air temperatures are usually well below seasonal norms.

Stable conditions–Occurs when a rising air parcel becomes denser than the surrounding air. It will then return to its original position.

Unstable conditions–Occurs when a rising air parcel becomes less dense than the surrounding air. Since its temperature will not cool as rapidly as the surrounding environment, it will continue to rise on its own.

Synoptic feature–A meteorological entity such as a high or low pressure system that covers a horizontal area of several hundred nautical miles.

Pipeline to the Arctic–A stream of cold air whose source is over the Arctic region.

Convergent line–Wind movement that results in a horizontal net inflow of air into a particular region. Convergent winds at lower levels are associated with upward motion.

Graupel–A form of frozen precipitation consisting of snowflakes or ice crystals and supercooled water droplets frozen together.

Canadian 120 hour Global Weather Model depiction–The forecast weather map valid at 120 hours produced by the Global Weather Model which was developed and is used in Canada.

Meteorological discussion bulletin–An internal weather bulletin intended for meteorologists describing the current and future weather situation.

Icebergs and Growlers in the South Atlantic—*SA Agulhas* Gough Relief Voyage

Ian T. Hunter, Manager, Maritime Services, South African Weather Service

Voluntary Observing Ships and Ice

The research ship **SA Agulhas** belongs to the Department of Environmental Affairs and Tourism in South Africa. She is managed by Smit Marine (SA) and makes regular voyages to the outlying weather stations run by the South African Weather Service. The vessel is the leading supplier of voluntary observing ship (VOS) reports in the South African VOF (voluntary observing fleet). These observations are frequently from data-sparse areas of the South Atlantic and South-West Indian Ocean.

During September and October the **Agulhas** undertook its annual relief cruise to Gough and Tristan Islands. She also did a week-long buoy deployment cruise which looped south-west of Gough Island down to latitude 50S.

The table below, provided by the vessel's Master, Captain Frikkie Viljoen, lists all icebergs sighted (longer than 50 m)—either visually or on the ship's radar :

The actual dimensions of the last iceberg were : 4.6 nmi x 2 nmi x 50 m freeboard

These observations were done at 6 hourly intervals.

In October 1998 a huge portion of the Ronne Ice Shelf broke away from the Antarctic mainland. It was over 80 nmi long and more than 26 nmi wide— 'A38' i.e. the 38th sighting to meet NIC (National Ice Centre) criteria, between Greenwich and 90W (area A). Within 9 days A38 had split into A38-A, A38-B and A38-C.

After almost 6 years A38-A was tracked to a position approximately 600 nmi SSW of Gough Island (NIC archives, last entry 10 August). It had been a captive of the western Weddell Sea for 4 years, and finally escaped to sail past the South Orkneys and South Georgia into the above position. Similarly A38-D, E & F (or fragments thereof)—had also drifted into the area where the Agulhas was sent to deploy her load of drifting weather buoys. A38-B and C were further west.

Thus it seems highly likely that at least some of the icebergs spotted by the ship have their origins in the Ronne ice shelf breakaway of October 1998.

Apart from the icebergs recorded by the deck officers of the SA Agulhas, a great many growlers were spotted in amongst the wind-swept waters of the South Atlantic. Perhaps the greatest danger posed by these lurking iceberg fragments is to ocean-going yachts competing at high latitudes. A 'bergy bit' with insufficient freeboard to trigger the radar alarm could well pierce a hull if struck at a high speed.

In February 2002 a voluntary observing ship reported seeing a growler/ 'bergy bit' at latitude 29° 45.6' south, off the coast of the Northern Cape. Needless to say the 'ICE' group in the VOS observation can contain some valuable information for navigational safety. ⚓

Icebergs encountered during the 'SAWS' buoy run, September 2004

22/09 1800 46° 49.4'S 017° 58.8'W	1(50-200m)	
23/09 0000 47° 34.6'S 018° 50.96'W	4(50-200m)	1(200-500m)
23/09 0600 48° 22.1'S 020° 00.2'W	1(50-200m)	
23/09 1200 49° 01.2'S 020° 43.3'W	3(50-200m)	1(200-500m)
23/09 1800 48° 52.5'S 020° 36.0'W	2(50-200m)	
24/09 0600 48° 35.0'S 021° 15.0'W	1(200-500m)	
24/09 1200 48° 32.4'S 021° 26.3'W	3(200-500m)	
24/09 2000 49° 07.0'S 019° 26.9'W	3(50-200m)	
25/09 0000 49° 30.1'S 018° 32.6'W	2(50-200m)	
25/09 0600 49° 58.9'S 017° 02.8'W	5(50-200m)	
25/09 1200 49° 02.1'S 016° 29.0'W	2(50-200m)	6(200-500m)
25/09 1800 48° 14.7'S 017° 20.3'W	4(50-200m)	1(200-500m)
26/09 0600 46° 24.3'S 014° 12.0'W	1(>1000m)	

Rogue Waves' Reported by Mariners Get Scientific Backing

PARIS (AFP) Jul 21, 2004

Reprinted with permission AFP/SpaceDaily.com

European satellites have given confirmation to terrified mariners who describe seeing freak waves as tall as 10-storey buildings, the European Space Agency (ESA) said on Wednesday.

"Rogue waves" have been the anecdotal cause behind scores of sinkings of vessels as large as container ships and supertankers over the past two decades.

But evidence to support this has been sketchy, and many marine scientists have clung to statistical models that say monstrous deviations from the normal sea state only occur once every thousand years.

Testing this promise, ESA tasked two of its Earth-scanning satellites, ERS-1 and ERS-2, to monitor the oceans with their radar.

The radars send back "imagettes" -- a picture of the sea surface in a rectangle measuring 10 by five kilometers (six by 2.5 miles) that is taken every 200 kms (120 miles).

Around 30,000 separate "imagettes" were taken by the two satellites in a three-week project, MaxWave, that was carried out in 2001.

Even though the research period was brief, the satellites identified more than 10 individual giant waves around the globe that measured more than 25 metres (81.25 feet) in height, ESA said in a press release.

The waves exist "in higher numbers than anyone expected," said Wolfgang Rosenthal, senior scientist with the GKSS Research Centre in Geesthacht, Germany, who pored over the data.

"The next step is to analyse if they can be forecasted," he said.

Ironically, the research coincided with two "rogue wave" incidents in which two tourist cruisers, the Bremen and the Caledonian Star, had their bridge windows smashed by 30-metre (100-feet) monsters in the South Atlantic.

The Bremen was left drifting without navigation or propulsion for two hours after the hit.

In 1995, the British cruise liner Queen Elizabeth II encountered a 29-metre (94.25-feet) wall of water during a hurricane in the North Atlantic.

Its captain, Ronald Warwick, likened it to "the White Cliffs of Dover."

In the next phase of research, a project called Wave Atlas will use two years of "imagettes" to create a worldwide atlas of rogue wave events and carry out statistical analyses, ESA said.

The goal is to find out how these strange, cataclysmic phenomena may be generated by ocean eddies and currents or by the collision of weather fronts, and which regions of the seas may be most at risk.

Finding out could help ship architects and the designers of oil rigs and their operators to skirt the menace.

Amver—A Look Behind the Blue and White Pennant

By Gary A Burke, Jr., Amver Applications Programmer II, USCG Operations System Center

Most mariners will instantly recognize the name Amver. For those who do not, the Amver system is a U.S. Coast Guard sponsored search and rescue (SAR) program. Participation in Amver is voluntary, and information is protected and used only in a bona fide maritime emergency. The Amver system consists of over 12,000 vessels from over 140 nations. This global participation allows Amver to be known as the only worldwide SAR system to date, unlike Japan and Australia who have their own vessel reporting systems, but the coverage area is limited to that country. Our participants faithfully report their vessel's movements, but very few mariners know what happens to their data once sent or the process by which it enters the Amver database.

To start our journey, let's first look at where the Amver system currently resides. The Amver system and its support staff are located at the U.S. Coast Guard's Operations System Center (OSC) in Martinsburg, West Virginia. No matter where vessels are in the world, their Amver message will ultimately be received at OSC. At OSC the Amver system is tagged with a "mission critical" status, meaning the Amver staff is required to maintain 99.5% system availability for our users. The Amver staff is on call 24 hours a day, 7 days a week to resolve any message traffic or system problems. The system is routinely taken down for regularly scheduled maintenance, which does not count against our 99.5% system availability. Even though the system is unavailable to users during this 8-10 minute timeframe, Rescue Coordination Centers (RCCs) can call OSC where we have the ability to run a Surface Picture (SURPIC) of the distress location through a "hot-wired" laptop and provide the RCCs with accurate Amver information. The Amver system has full system redundancy with a production server and "hot" backup server that mirrors production. A third "test" server allows the staff to completely test any new technology as if it were in the production environment.

Now you know where vessel messages go, let's look at how they get here. Nearly all Amver message traffic is received at OSC via e-mail; the only exception being a small number of faxed messages. The Amver program has an "e-mail solution" in place with all of the participating traffic providers, so if a vessel is sending reports via ATT telex or AmverSeas, the e-mail solution will forward the report to OSC. Vessels can also send e-mail reports directly to OSC via the ship's Internet Service Provider (ISP). The message must be addressed to amvermsg@amver.com and reports should be sent in plain text in the body of the e-mail.

What about e-mail viruses, junk mail and SPAM? Not a problem. All e-mail passes through the Coast Guard's mail hub, which scans every e-mail using the latest virus definition. Filtered and cleaned, the e-mail then must be accepted by our procmail instance. Procmail is Amver's own personal address book of valid senders. If a sender is not in our procmail file, the e-mail message will be sent to a rejects directory. The rejects directory is checked several times a day, and rejected messages are researched and determined to be valid or bogus. For valid messages a new entry will be made to the procmail file, which will allow the next message received to be processed normally. Bogus senders are rejected outright.

Junk e-mails and SPAM can be blocked with a simple entry into Amver's amprc file. The amprc file is a vital part of Amver's e-mail delivery process. Not only can it block junk e-mail and SPAM, amprc also allows Amver to sort out emergency/distress messages for immediate action. Somewhat similar to procmail, amprc contains a listing of "attention keywords" like distress, immediate, fire, etc. Amprc will review each Amver report looking for specific keywords. If a keyword is received, the delivery process will "kick" the report out to Amver's attention directory. The attention directory is monitored every 7 minutes. If the directory contains a report, an audible alarm sounds in the Amver watch. The Amver Analyst determines if there is a real distress and routes the message accordingly. For junk e-mail and SPAM it's the same process, except when a "junk" message is found the report is rejected immediately without Analyst intervention.

Now the delivery process is complete, the reports must be parsed. In May 2002 the Amver Team completed the final stage of its message parser rewrite. When the new automated message parser (AMP) rolled into production in May 2002, Amver took a giant leap forward. Amver's new parser incorporates the new e-mail technology with message correcting capabilities and, most importantly, automation of data entry. Prior to May 2002, every Amver message was reviewed

and entered by an Amver Analyst. When AMP rolled into production approximately 65 percent of all message traffic was getting entered automatically. AMP also employs message-correcting capabilities. Even though all Amver reports are supposed to be in the International Maritime Organization (IMO) standard format, many need to be fixed. To combat this AMP has a "fix general" routine that will remove imbedded spaces, carriage returns, and correct simple formatting errors within the message. From there AMP performs a "fix by line" routine. Each specific line of an Amver IMO standard report has a routine. When building the parser we compiled a list of bad report formats for each line and incorporated this into AMP's "fix by line" routine, fixing each bad report format. Message correction is done within seconds of the message being received from the delivery process.

Even though AMP is now processing the majority of the 3900+ Amver messages received daily, the parser relies on the Amver Analysts to remain effective. For example, when validating a sail plan, AMP will first try and use the information provided by the vessel. AMP reiterates through several processes to determine if this information is accurate and if the turn points are correct. If AMP determines the information is not correct, it will look into the database to see if the vessel has any similar voyages that match the current route and use the one with the least amount of deviation. If AMP cannot find a similar voyage in the vessel's history, it will reference all previously committed routes in the database and use the one with the least amount of deviation. At this point if no route is found, AMP will pass the message on to the Amver Analysts. Once the Amver Analyst enters the route, it will be available for AMP to use the next time a similar voyage is received.

AMP will try and enter every report it receives with the exception of a deviation report. Every deviation report sent to Amver is passed to the Analysts for entry. Most deviation reports received lack the detailed information needed to have AMP enter them correctly. For all other report types, several different validation checks are built into AMP, which will have to be met in order to process the report. If AMP should fail to meet any of our validation checks, it will not process the report and the report is passed to the Amver Analysts. One example is a deviation check. If AMP determines a vessel's deviation exceeds more than 50 nmi off our predicted track, it will pass the report to the Analysts. Another example is a report missing required information, such as a position report without a current speed or time.

AMP is kept accurate by the Amver Analysts who extensively research all route discrepancies and reporting errors to determine the best possible solution. All these validation checks ensure the messages are correct and AMP remains accurate.

Once vessel messages have been entered, the information is released onto the active plot. On the active plot, Amver continually positions the vessel in time. Using dead reckoning, Amver will continue to move the vessel along its intended track using the reported speed and course until the next update from the vessel is received. So when the Rescue Coordination Centers (RCCs) access Amver information for a SAR case, the information they receive will be a listing of all the vessels within the distress area using Amver's last known good update. This plot information is updated every hour to keep the information as close to real time as possible.

Now you've seen what goes on behind the scenes, hopefully you'll have a better understanding of the Amver system. If you have any questions about Amver or would like to learn more about the Amver system check out our web site at www.amver.com. The entire Amver staff at OSC Martinsburg would like to wish all our mariner friends our best wishes for continued safe passage abroad. ⚓

Shipwreck: *Carl D. Bradley*

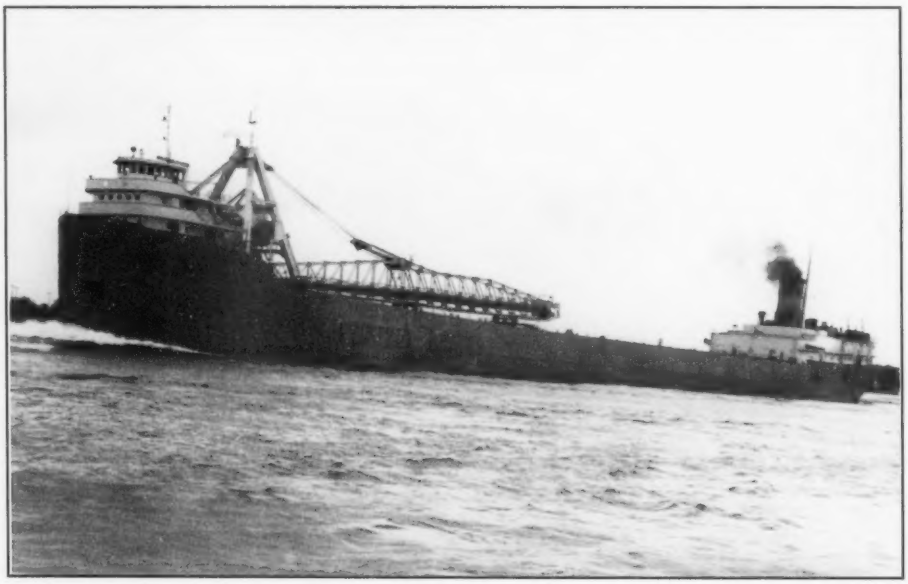
By Skip Gilham, Vineland, Ontario, Canada

Ships capable of discharging their own cargoes are now the norm on the Great Lakes. Free flowing commodities such as taconite ore, coal, salt, potash, gypsum, sand, stone, and grain can be unloaded to shoreside facilities via a boom and conveyor belt.

The first brand new vessel of this type was the 304 foot long **Wyandotte** of 1908. Similar ships were added to the inland fleet and by 1927 another new freighter, the largest yet, was completed at Lorain, Ohio.

This 638 foot long steamer was launched on April 9, 1927, and commissioned as the **Carl D. Bradley** on July 28. The ship went to work for the Bradley Transportation Company and immediately set a cargo record for limestone delivering 14,627 tons from Calcite, Michigan, to Buffington, Indiana. The **Carl D. Bradley** reset the limestone record on numerous subsequent occasions as the company had a contract to deliver a million tons annually to Universal Portland Cement.

The McArthur Lock was opened at Sault Ste. Marie, Michigan, on July 11, 1943, and the **Carl D. Bradley**, en route to Algoma Steel at Sault Ste. Marie, Ontario with limestone, was the first ship to use the new lock. The vessel is shown, several years later, off Port Huron, Michigan, in a photo by Paul A. Michaels.



Carl D. Bradley continued to carry impressive payloads for the owners and was slated for a major renovation to the cargo holds at the end of the 1958 season. In addition, two groundings off Port Dolomite, near Cedarville, Michigan, during the year had left some hull damage that required attention.

After discharging the last load of the season, the **Carl D. Bradley** was upbound on Lake Michigan. Sixty mile an hour winds and towering waves battered the cargoless ship and on November 18, 1958, the hull suddenly cracked.

There was little time to react as the **Carl D. Bradley** quickly succumbed and sank to a depth of 360 feet southwest of Boulder Reef. Those who were able to get off the doomed ship took to the lifeboats, but by the time they could be found many hours later only two men from the crew of 35 had survived the harrowing ordeal. ⚓

Autumn Sunrise/Sunset in Duluth Harbor

Photographs courtesy of Barb Fuller

Marine Weather Review—North Atlantic Area May through August 2004

By George P. Bancroft, National Center for Environmental Prediction

Introduction

Most of the significant developments of low-pressure systems during this period were over the far northern reaches of the Atlantic after the lows initially passed off the Canadian coast, with a few originating over the central waters. Several of these developed storm-force winds and are described below.

Tropical cyclone activity during this four-month period was concentrated during August, although the Atlantic hurricane season officially begins June 1. Of the eight named tropical cyclones that formed during this period, six affected OPC's marine area of responsibility north of 31N, and are described below. Alex was the only major hurricane to affect OPC's marine area through the end of August, and was also the only tropical system to re-intensify into a storm-force low after becoming extratropical.

Tropical Activity

Hurricane Alex: Tropical Depression One formed late on July 31 off the north Florida coast and drifted north-northeast, intensifying into Tropical Storm Alex about 120 nmi off the Georgia coast twenty-four hours later, with maximum sustained winds of 35 Kt and gusts to 45 Kt. The cyclone became a hurricane while passing about 90 nmi southeast of Cape Fear early on August 3, and developed maximum sustained winds of 85 Kt with gusts to 105 Kt when passing just east of Cape Hatteras on the afternoon of August 3. After weakening through the morning of August 4 but still remaining a hurricane while moving offshore, Alex strengthened into a major hurricane on the evening of August 4 about 300 nmi south of Nova Scotia. Maximum sustained winds of 105 Kt with gusts to 130 Kt were maintained from the night of August 4 through the following morning. This intensity is rated Category 3 on the Saffir-Simpson scale of hurricane intensity (***Reference 1.***) ***Figure 1*** depicts the hurricane in an enhanced infrared satellite image just prior to attaining peak intensity. A well-defined eye is apparent near 38N 68W, surrounded by a circular central dense overcast containing the coldest cloud tops which are enhanced in this type of image. Selected ship, buoy and C/MAN platform observations taken near the storm are shown on the right in ***Table 1.***

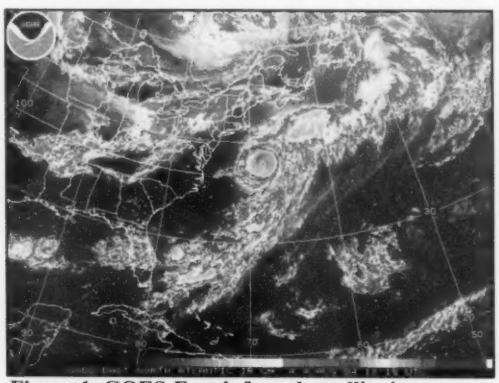


Figure 1. GOES-East infrared satellite image valid at 1815 UTC August 4, 2004. Satellite senses temperature on a scale from black (warm) to white (cold) in this type of imagery, but image has coldest temperatures enhanced to make the highest cloud tops stand out.

As Alex passed south of the Canadian Maritimes the Canadian buoy 44140 (43.8N 51.8W) reported a minimum pressure of 979.3 hPa at 2200 UTC August 5, and maximum seas of 6.5 m (21 ft) one hour later. A ship, the **Enterprise** (WAUY), encountered southwest winds of 40 Kt and 9.5 m seas (31 ft) near 36N 68W at 1800 UTC August 4 and again three hours later.

Alex then entered the next stage in its evolution, transformation into an extratropical storm, as shown in ***Figure 2***. Alex passed north of the Gulf Stream and over cooler water and began to weaken late on August 5, and at the same time approached a frontal zone to the north. The first part of ***Figure 2*** shows Alex still a hurricane at the synoptic time, but the boxed text indicates Alex was downgraded to a tropical storm at the advisory time of 1500 UTC August 6. The cyclone then merged with the nearby frontal system and re-intensified into the extratropical storm shown in the second part of ***Figure 2***, the third deepest of the period in the North Atlantic with a lowest central pressure of 972 hPa. At 1800 UTC August 7 the **Faust** (WRYX) reported a northwest wind of 50 Kt near 50N 21W.

OBSERVATION	POSITION	DATE/TIME(UTC)	WIND	SEAS(m/ft)
Tanabata (WCZ5535)	32N 67W	03/1800	S 34	
Charles Island (C6JT)	33N 72W	04/0000	S 50	
Enterprise (WAUY)	36N 67W	04/1500	W 35	
Buoy 41013	33.5N 77.6W	03/0700	NE 33G45	4.0/13
Buoy 41001	34.7N 72.7W	032200 04/0100 04/0200	S 29 Peak gust 39	5.0/16 maximum 6.0/20
Buoy 41025	35.2N 75.3W	03/1600*	SE 47 G62	6.5/21
Cape Lookout (CLKN7)	34.6N 76.4W	03/1400	N 51 Peak gust 62	
Duck Pier (DUCN7)	36.2N 75.6W	03/2000	NE 39 G43 Peak gust 45	

Table 1. Some observations taken off the U.S. East Coast during passage of Hurricane Alex.

***Buoy 41025 became disabled and reported its last observation at this time.**

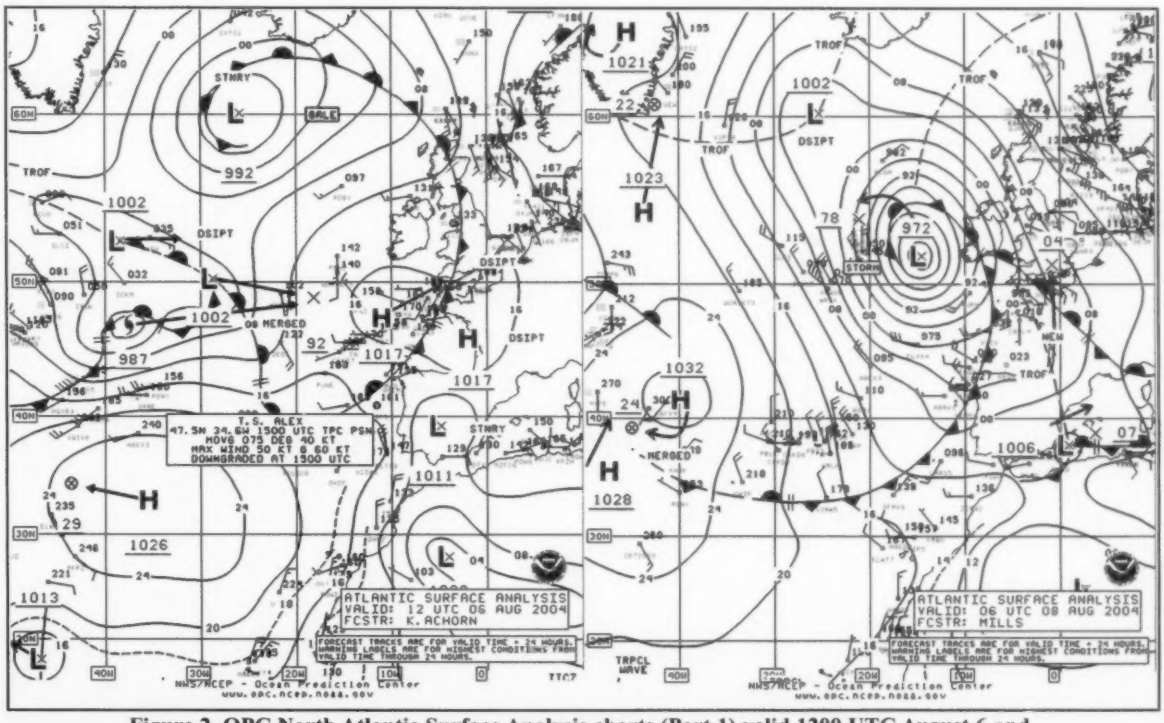


Figure 2. OPC North Atlantic Surface Analysis charts (Part 1) valid 1200 UTC August 6 and 0600 UTC August 8, 2004, showing Hurricane Alex becoming an extratropical storm.

A QuikScat image taken at about that time (***Figure 3***) reveals winds to 60 Kt just east of the ship's location. The system subsequently turned northwest and weakened to a gale-force low late on August 8, before looping to the south and then east toward Great Britain. The remains of Alex passed over Great Britain on the 12th before moving inland over the European mainland early on the 14th.

Tropical Depression Bonnie: Bonnie, after moving through the Gulf of Mexico as a tropical storm, weakened while passing inland over northwest Florida on August 12. Bonnie then moved along the U.S. East Coast just inland as a tropical depression from late on August 12 through the 13th, with minor effects offshore, before dissipating over southern New England. The ship (MXGU3) reported a south wind of 35 Kt near 34N 76W at 1800 UTC August 13.

Hurricane Charley: Charley, after maintaining hurricane strength while passing through the Florida peninsula, entered the far southwest part of OPC's offshore waters near 31N 80.5W early on August 14 with maximum sustained winds of 75 Kt and gusts to 90 Kt. Charley then moved to the coast near Cape Romain by 1800 UTC August 14 and then weakened to a tropical storm inland over eastern North Carolina at 2100 UTC on the 14th, with maximum sustained winds of 50 Kt and gusts to 60 Kt. After passing near the Virginia capes as a minimal tropical storm on the evening of the 14th, Charley became extratropical and merged with a frontal zone over southeast Massachusetts on the morning of the 15th, before dissipating over Nova Scotia on the 16th. The more notable observations taken during the passage of Charley are listed in ***Table 2***.

Tropical Storm Danielle: Danielle, once a hurricane over the open waters of the eastern tropical Atlantic, weakened to a minimal tropical storm while approaching OPC's high seas area from the south, near 30.3N 37.0W at the 0900 UTC advisory time on August 20. OPC's high seas area is north of 31N and west of 35W. Danielle weakened to a tropical depression near 31N 38W twelve hours later, and then dissipated on the 21st about 800 nmi southwest of the Azores.

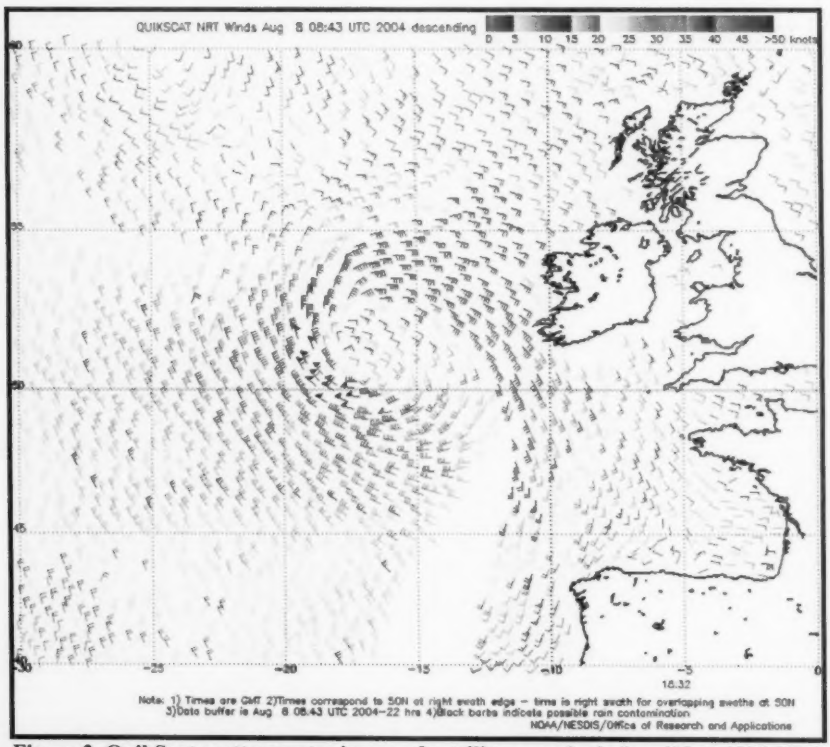


Figure 3. QuikScat scatterometer image of satellite-sensed winds valid at 1832 UTC August 7, 2004. The valid time of the pass is about eleven and one-half hours prior to the valid time of the second part of Figure 2.

Image is courtesy of NOAA/NESDIS/Office of Research and Applications.

Tropical Storm Gaston: Tropical Depression Seven formed from a non-tropical area of low pressure about 120 nmi southeast of Cape Romain at 2100 UTC August 27 and became Tropical Storm Gaston the next morning while drifting northwest toward the coast. Gaston moved inland just northeast of Charleston early on August 29 with maximum sustained winds of 60 Kt and gusts to 75 Kt, just below hurricane strength. The cyclone then weakened to a depression on the evening of the 29th while inland over the Carolinas, before re-strengthening to a tropical storm while moving offshore from the Delmarva Peninsula late on the 30th. ***Figure 4*** shows Gaston moving back over water as a tropical storm at 0600 UTC August 31. Gaston then headed northeast to Georges Bank on the 31st and began to become extratropical south of Nova Scotia at the end of the month. Some notable observations taken during the passage of Gaston are listed in ***Table 3***.

OBSERVATION	POSITION	DATE/TIME(UTC)	WIND	SEAS(m/ft)
MOL Virtue (A8BZ6)	37N 75W	15/0300	SW 42	
Buoy 41008	31.4N 80.9W	14/0900 14/1100	NE 33 G43	2.0/7 maximum 3.0/10
Buoy 41004	32.5N 79.1W	14/1300 14/1400	SE 43 G64	maximum 7.5/25
Buoy 41013	33.5N 77.6W	14/1700 14/1900	S 37 G49	maximum 5.0/16
Buoy 44014	36.6N 74.8W	15/0200	SW 31 G37	2.5/8
Folly Island (FBIS1)	32.7N 79.8W	14/1200	NE 42 G50 Peak gust 56	
Duck Pier (DUCN7)	36N 75.6W	14/2200	SW 37 G48	
Cape Lookout (CLKN7)	34.6N 76.4W	14/1900	S 34 G39 Peak gust 46	
Chesapeake Light (CHLV2)	36.9N 75.6W	14/2200 14/2300	NE 46 G50 Peak gust 63	

Table 2. Ship, buoy and coastal C/MAN station observations taken during the passage of Charley.

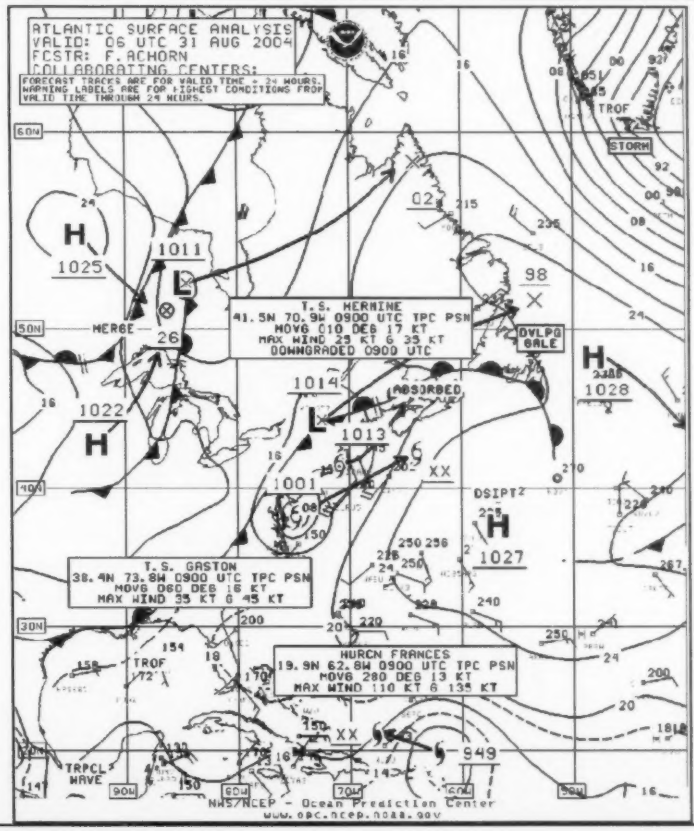


Figure 4. OPC North Atlantic Surface Analysis chart (Part 2–west) valid 0600 UTC August 31, 2004.

OBSERVATION	POSITION	DATE/TIME(UTC)	WIND	SEAS(m/ft)
Tellus (WRYG)	40.6N 63.2W	01/0000	SW 44	5.0/17
Buoy 41004	32.5N 79.1W	29/1000		maximum 6.0/20
Buoy 41013	33.5N 77.6W	29/1000	SE 27 G35	2.5/8
Buoy 44014	36.6N 74.8W	31/0600 31/0400	SW 27 G37	2.5/8 maximum 3.0/10
Buoy 44004	38.5N 70.5W	31/1600 31/1700	SW 33 G43	4.0/13 maximum 5.5/18
Buoy 44008	40.5N 69.4W	31/2200	NW 31 G41	5.5/18
Buoy 44137	42.3N 62.0W	01/1000 01/1300	NW 29 G 43	3.5/11 maximum 4.5/15
Buoy 44141	43.0N 58.0W	01/1200 01/1800	S 31 G49	2.5/8 maximum 5.0/16
Folly Island (FBIS1)	32.7N 79.8W	29/1200 29/1300	NW 32 Peak gust 47	G40
Chesapeake Light (CHLV2)	36.9N 75.6W	31/0100	SW 43 G50	2.0/7

Table 3. Ship, buoy and coastal C/MAN station observations taken during passage of Tropical Storm Gaston.

Tropical Storm Hermine: Hermine was short-lived. Like Gaston and Alex before it, Hermine formed outside the tropics off the U.S. southeast coast about 360 nmi west of Bermuda on the afternoon of August 29 and moved north, developing maximum sustained winds of 45 Kt with gusts to 55 Kt while passing 200 nmi east of the Delmarva Peninsula on the afternoon of the 30th. Hermine then weakened to a tropical depression near Cape Cod early on August 31 while Gaston was emerging off the Delmarva coast (***Figure 4***). Hermine then merged with a frontal zone to the north later that day.

Other Significant Events of the Period

North Atlantic Storm, May 3–4: An area of low pressure moved off the Labrador coast early on May 2, to the southeast Greenland coast late on May 2. The system then moved east-southeast toward Great Britain while rapidly intensifying (***Figure 5***). The central pressure dropped 29 hPa in the twenty-four hour period covered by ***Figure 5***, the fastest intensification of any non-tropical low during this period. The center developed a pressure as low as 970 hPa (second deepest of the four-month period) near the coast of Scotland at 1200 UTC on the 4th. Among several buoys west of Great Britain, 44551 (55.5N 17W) reported the strongest wind (northwest 45 KT) at 0300 UTC May 4, while the others reported winds in the 30 to 40 KT range. A QuikScat image taken near 0600 UTC on the 4th (not shown) revealed a small area of 50 KT northwest winds near 54N 14W. Buoy 62090 (53N 11W) reported seas as high as 10.0 m (33 ft) at 1000 UTC May 4. Buoy 62081 (51N 13.5W) had seas up to 9.5 m (31 ft) at 1200 UTC on the 4th. The storm subsequently stalled and weakened over Great Britain on the 5th, before lifting northwest the next day and dissipating near Iceland on May 8.

North Atlantic Storm of May 25–26: This development over the central waters is shown in ***Figure 6***, covering a 36-hour period. The period of most rapid development was in the twenty-four hour period after 1200 UTC May 24, the valid time of the first part of ***Figure 6***, when the central pressure dropped 29 hPa. This matched the rate of deepening of the early-May storm described above. This storm became the most intense (in terms of central pressure) of the four-month period in not only the North Atlantic but also the North Pacific as well, and the second part of ***Figure 6*** shows the storm at maximum intensity, 968 hPa.

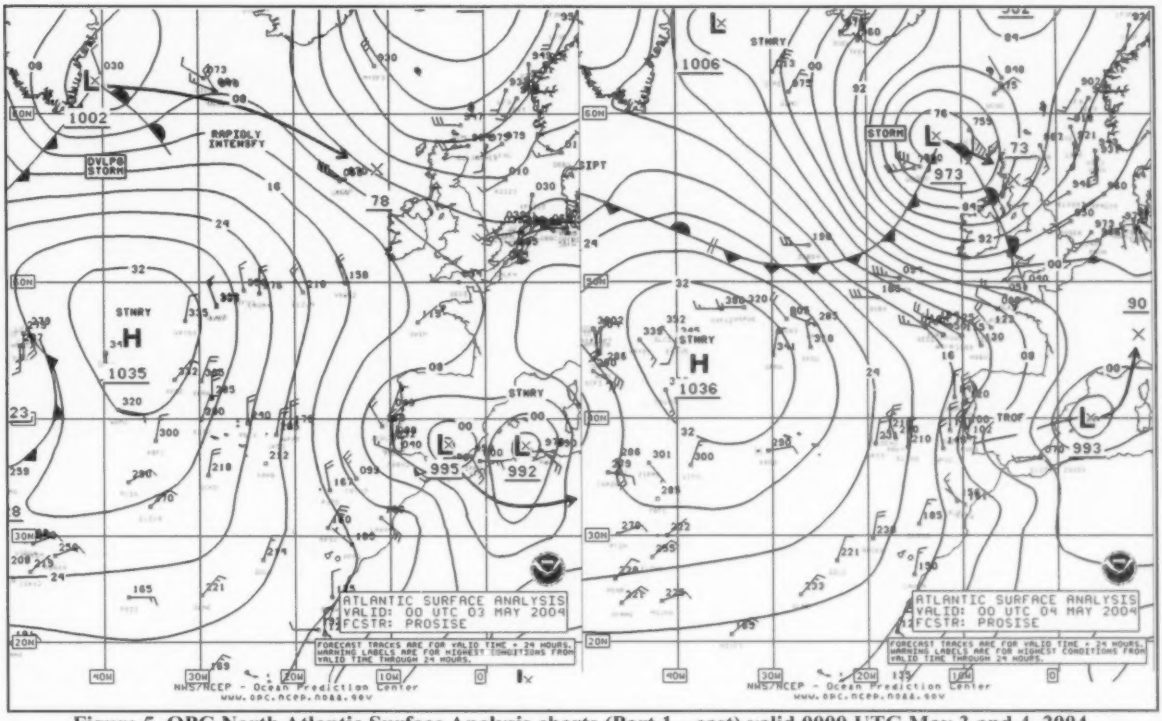


Figure 5. OPC North Atlantic Surface Analysis charts (Part 1—east) valid 0000 UTC May 3 and 4, 2004.

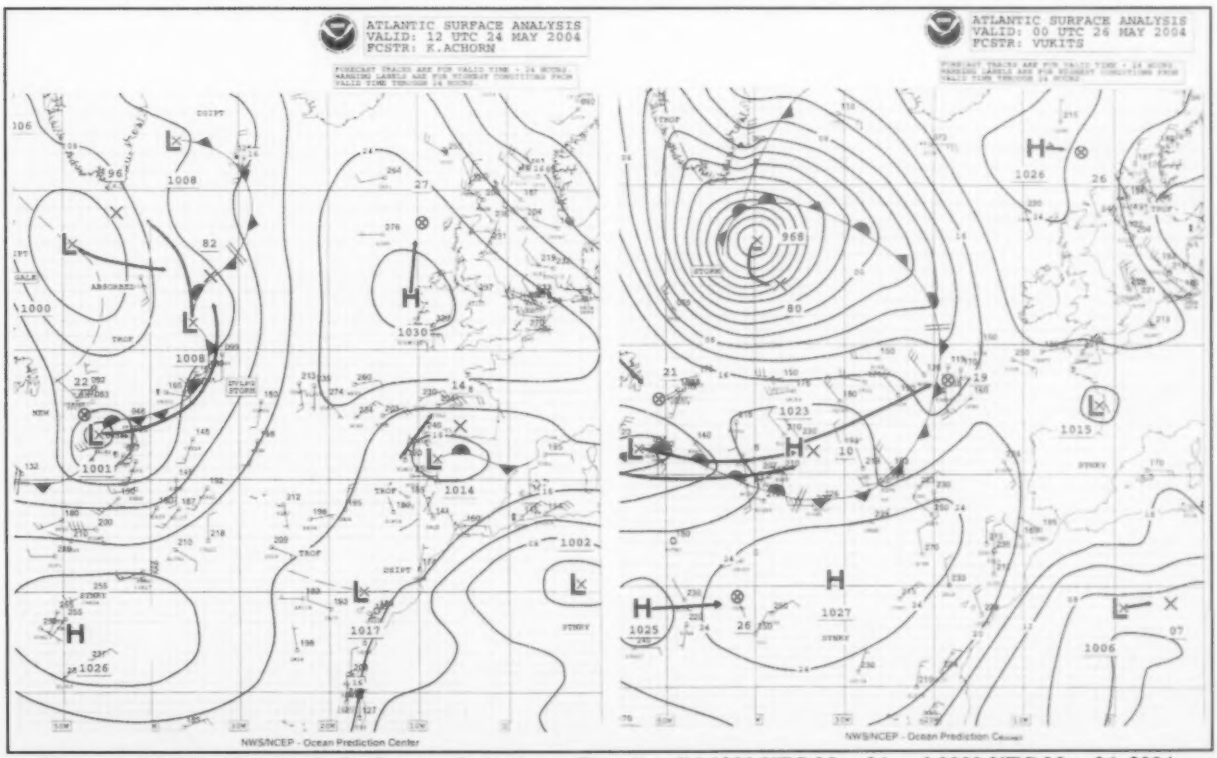


Figure 6. OPC North Atlantic Surface Analysis charts (Part 1) valid 1200 UTC May 24 and 0000 UTC May 26, 2004.

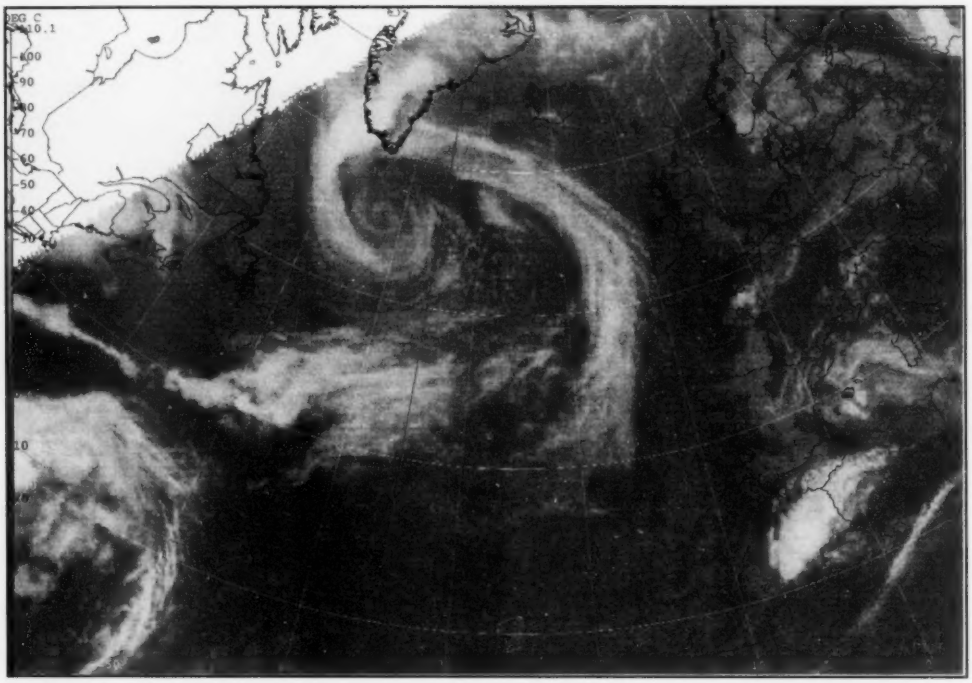


Figure 7. METEOSAT-7 infrared satellite image valid at 0600 UTC May 26, 2004. Satellite senses temperature on a scale from black (warm) to white (cold) in this type of imagery. The storm in *Figure 6* is shown near maximum intensity, with the time of the image about six hours later than the valid time of the second part of *Figure 6*.

The storm is shown six hours later in the satellite picture of ***Figure 7*** as it was looping back to the south. The system appears as a mature well-defined cloud spiral around the center south of Greenland, with the frontal cloud band extending almost to Ireland. With the storm's passage through an area lacking in ship reports, QuikScat data becomes especially useful. The satellite-derived winds shown in ***Figure 8*** reveal winds of 50 KT almost surrounding the center near 57N 39W, with a 55 KT wind barb appearing near the top of the figure. A ship, **Independent Action** (A8CF9) near 48N 36W, encountered west winds of 45 KT at 1800 UTC May 25, well south of the storm center. The system subsequently moved southeast and weakened to a gale near 54N 37W at 0000 UTC May 27, before drifting east. The low dissipated 600 nmi west of Scotland by month's end.

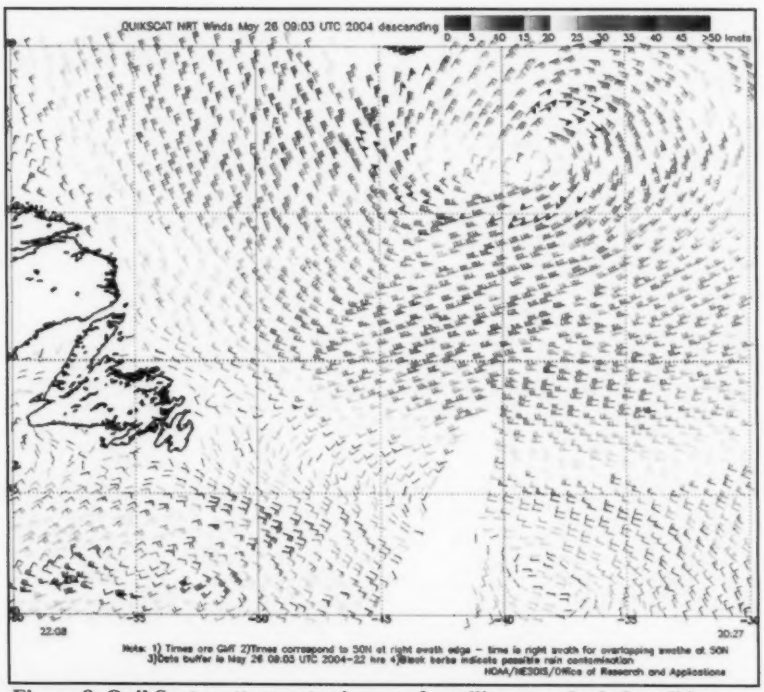


Figure 8. QuikScat scatterometer image of satellite-sensed winds valid at 2208 UTC May 25, 2004. The valid time of the pass is about two hours prior to the valid time of the second analysis in *Figure 6*.

Image is courtesy of NOAA/NESDIS/Office of Research and Applications.

North Atlantic Storm of June 3–4: This storm followed a track toward the north-central waters like the late-May storm, but originated near the mid-Atlantic coast on June 1 and was not as intense. The deepening center passed east of Newfoundland at 0000 UTC June 3, and then briefly became a storm near 57N 36W with a 986 hPa central pressure at 0600 UTC on the 4th. Six hours later the ship **Stadiongracht** (PDBY) near 54N 38W reported a west wind of 50 KT. The system continued on a northeast track and weakened to a gale late on the 4th, before dissipating west of Norway on the 7th.

Northeast Atlantic Storm of June 24–27: This storm was the stronger of two lows which moved east and then northeast from the Canadian Maritimes in late June and developed into storm-force lows over the far northern waters between Greenland and Iceland before stalling and weakening. The first moved east from Newfoundland on June 22 and then intensified after absorbing another low dropping south from Iceland (***Figure 9***). The maximum intensity of 977 hPa was reached near 52N 26W, twelve hours later than the first part of ***Figure 9***. The ship **M/V Freedom** (WDB5483) (48N 24W) encountered west winds of 45 KT at 0600 UTC on the 26th. The storm then lifted north to near Iceland and then looped to the southwest by early on the 27th (second part of ***Figure 9***). The **Atlantic Peace** (DEOT) reported northeast winds of 60 KT off Greenland's east coast at 0000 UTC and 0600 UTC June 27. The system then stalled and weakened, and was absorbed by the second of the two lows early on the 29th, which looped southwest of Iceland on the 30th before moving toward Great Britain and weakening on July 1.

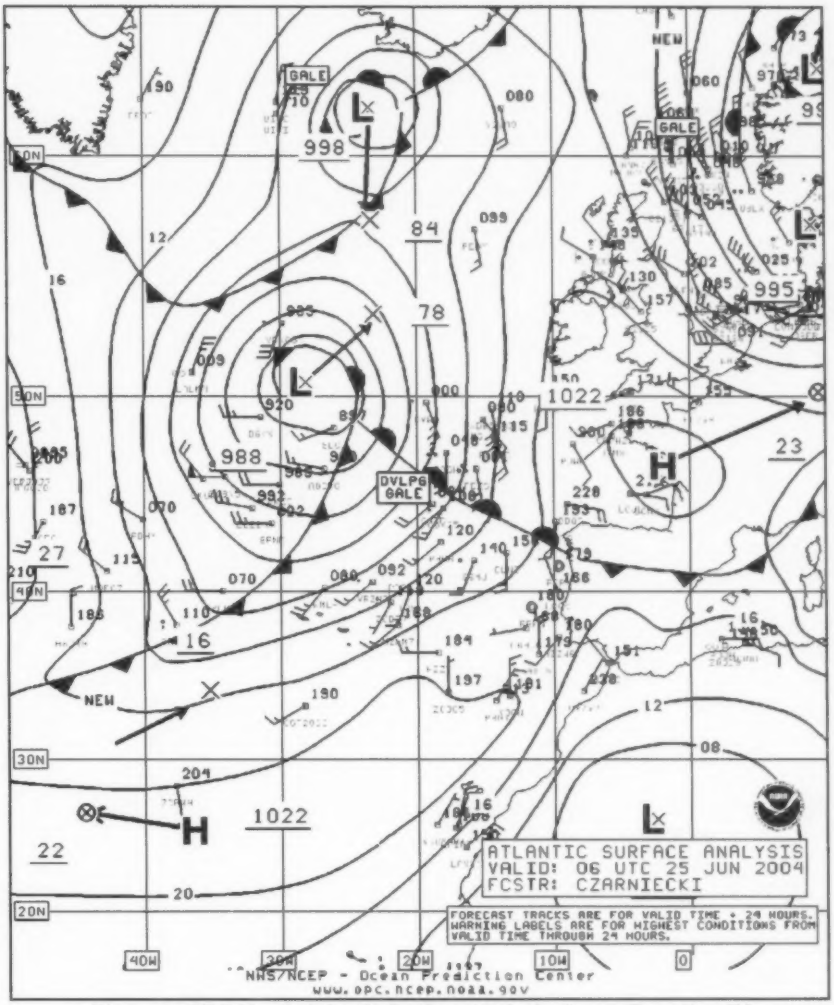


Figure 9. OPC North Atlantic Surface Analysis charts (Part 1) valid 0600 UTC June 25 and 27, 2004.

North Atlantic Storm of August 30–31: This developing storm took a more northern track typical of late summer as shown in ***Figure 10***. After leaving the Labrador coast early on August 28, the system redeveloped on the east side of Greenland at 0000 UTC on the 31st, becoming the storm shown in the second part of ***Figure 10***. The **Atlantic Peace** (DEOT) encountered storm-force northerly winds near 62N 40W from 0000 UTC August 30 through 0600 UTC August 31, peaking at 58 KT at 0000 UTC on the 31st. These observations agree well with a QuikScat image showing 50 to 60 Kt winds west and northwest of the storm center (***Figure 11***). As the system drifted east at month's end, the **Nuka Arctica** (OXYH2) reported northwest winds of 45 Kt near 59N 45W at 1800 UTC August 31. ⚓

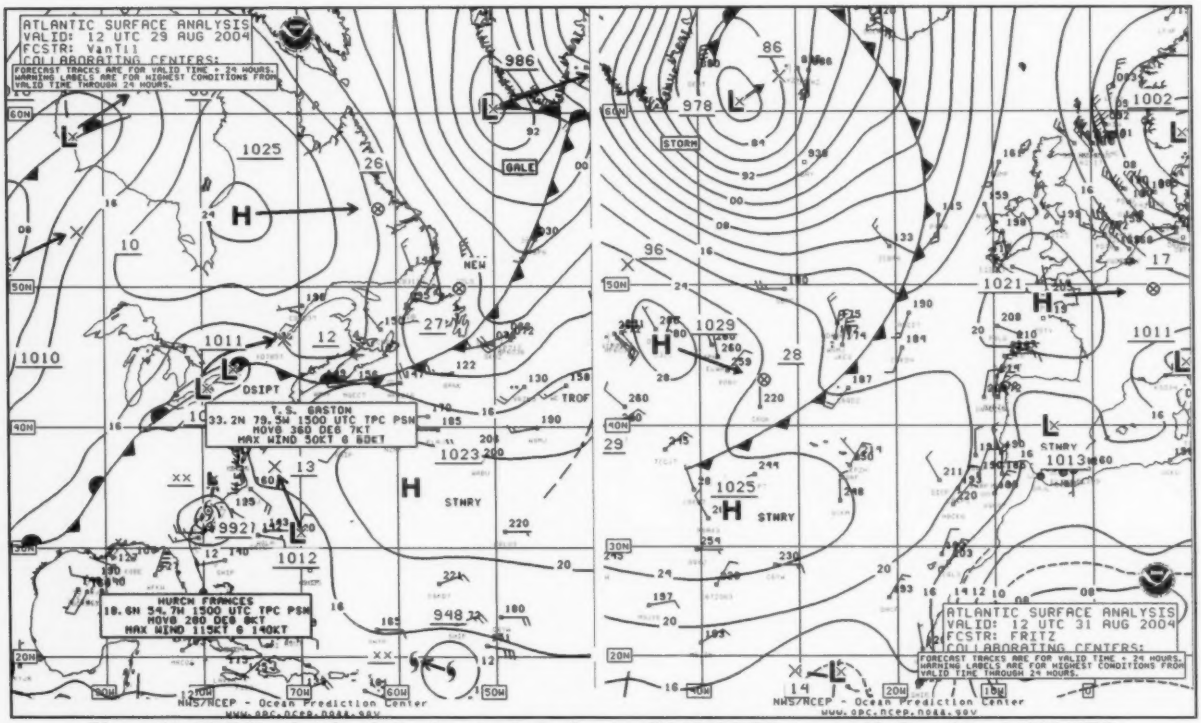


Figure 10. OPC North Atlantic Surface Analysis charts valid 1200 UTC August 29 (Part 2) and 1200 UTC August 31, 2004 (Part 1).

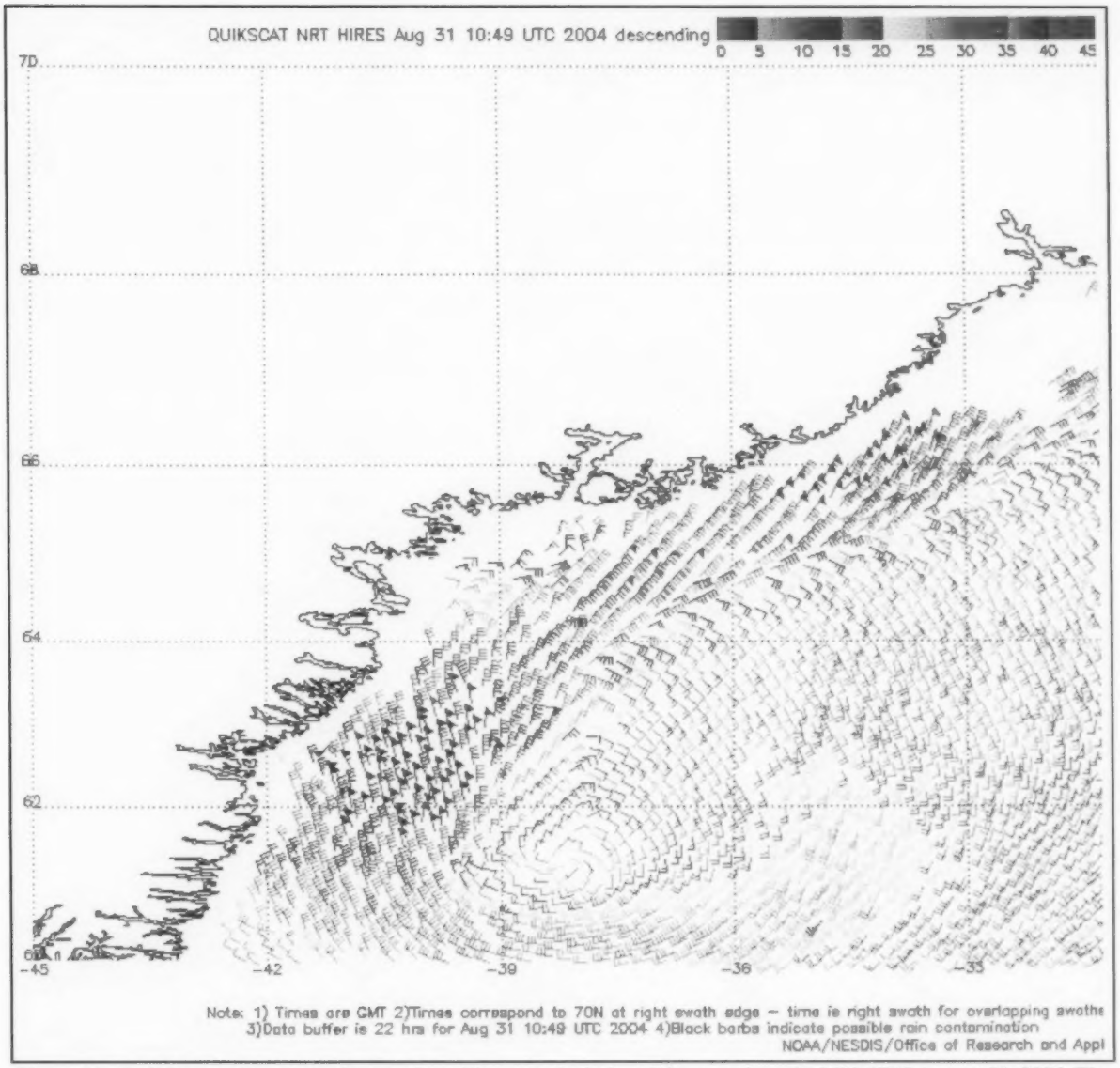


Figure 11. QuikScat scatterometer image of satellite-sensed winds valid approximately 0600 UTC August 31, 2004. The valid time of the pass is about six hours prior to the valid time of the second analysis in *Figure 10*.

Image is courtesy of NOAA/NESDIS/Office of Research and Applications.

References

1. From Tropical Prediction Center website, www.nhc.noaa.gov/; and also Pasch, Richard J. and Lawrence, Miles B., *Atlantic Hurricanes* (Weatherwise, March/April 2003).

2. Bancroft, G. and Sienkiewicz, J., *High Seas Text Bulletins Issued by MPC* (Mariners Weather Log, Summer 1996).

Marine Weather Review—North Pacific Area May through August 2004

By George P. Bancroft, National Center for Environmental Prediction

Introduction

The most active part of the North Pacific during this period was the west portion, both for tropical cyclones and non-tropical systems. Unlike in the North Atlantic, tropical activity in the western North Pacific was well distributed through the four-month period, with many of these cyclones recurving in the vicinity of Japan before entering the westerlies and becoming extratropical. Some of the tropical cyclones re-intensified into storm-force lows after becoming extratropical. Also, some of the non-tropical low-pressure systems of this period developed storm-force winds, primarily early in May and in August, in the western waters. The four-month period covered in this article, being the warm season, is the least active period for non-tropical low-pressure systems.

Tropical Activity

Typhoon Nida: Nida entered OPC's oceanic area for (Mercator) radiofacsimile charts near 29N 136E at 1200 UTC May 20 with maximum sustained winds of 80 KT and gusts to 100 KT. The cyclone moved northeast and weakened to a tropical storm six hours later. By 0600 UTC on the 21st Nida was about 250 nmi northeast of Tokyo with maximum winds 45 KT with gusts to 55 KT, about to become extratropical. ***Figure 1*** shows Typhoon Nida approaching a frontal zone and becoming an extratropical storm at 1200 UTC May 21 east of Japan. While Nida was still a typhoon, the **Mokihana** (WNRD) encountered southwest winds of 50 KT and 10.5 m seas (35 ft) near 22N 132E at 0000 UTC May 20. The vessel **CMA CGM Alabama** (DGGV) (24N 137E) reported south winds of 40 KT and 6.5 m seas (21 ft) six hours later. The **Sea-Land Reliance** (WFLH) reported east winds of 45 KT near 39N 149E at 0000 UTC on the 21st, and east winds at 50 KT near 41N 153E twelve hours later. The extratropical storm attained a central pressure of 988 hPa near 40N 148E at 1800 UTC May 21, when the **President Jackson** (WRYC) encountered east winds of 50 KT 60 nmi to

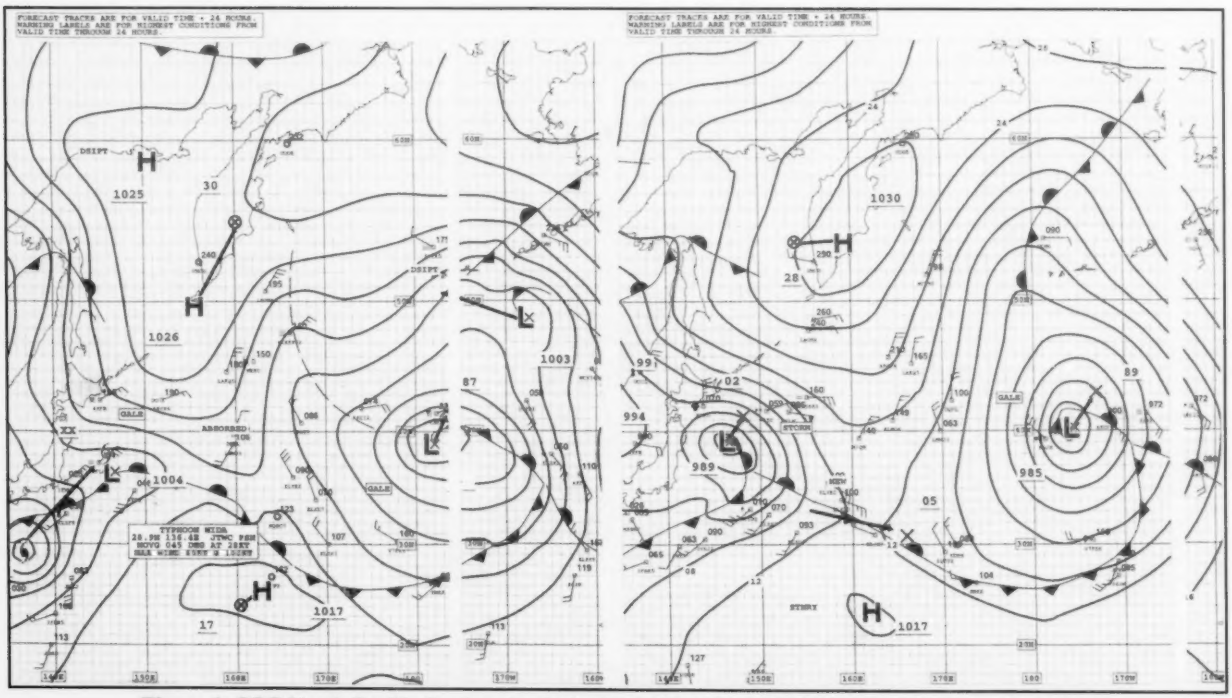


Figure 1. OPC North Pacific Surface Analysis charts (Part 2) valid 1200 UTC May 20 and 21, 2004. Typhoon Nida is shown becoming an extratropical storm.

the north. After that, the system that was Nida continued to move northeast and weakened.

Tropical Storm Omais: Omais followed Nida on a similar track south of Japan as a minimal tropical storm on May 21, with maximum sustained winds of 35 KT with gusts to 45 KT. The cyclone then weakened to a tropical depression near 21N 136E at 0600 UTC May 22, before becoming extratropical and merging with a frontal zone near 40N 150E two days later. By 0000 UTC May 27 the low-pressure area that was Omais redeveloped into a gale with a central pressure of 985 hPa just south of the western Aleutians. The system then tracked east-northeast, stalled and weakened in the central Gulf of Alaska late on May 29.

Super Typhoon Dianmu: Dianmu appeared on OPC's Mercator oceanic analysis area near 16N 135E, or 1000 nmi south of Japan, at 1800 UTC June 16 with maximum sustained winds of 155 KT with gusts to 190 KT, the strongest typhoon of the period. The cyclone then tracked west-northwest, west of the area while gradually weakening, before recurving to the northeast on the 20th and weakening to a tropical storm near the southwest coast of Japan at 1800 UTC on June 20. The **President Truman** (WNDP) encountered southeast winds of 40 KT near 33N 136E six hours later. Dianmu then moved northeast into the Sea of Japan near 39N 138E at 1200 UTC on the 21st with maximum winds of 40 KT with gusts to 50 KT. The cyclone became an extratropical gale over northern Japan later on the 21st, followed by weakening in the Sea of Okhotsk on June 23.

The remains of Dianmu then dissipated over the northwest Bering Sea late on June 25.

Tropical Storm Mindulle: Tropical Depression 10W formed near 16N 144E at 0600 UTC June 23 and moved west-northwest, becoming Tropical Storm Mindulle six hours later with maximum sustained winds of 35 KT with gusts to 45 KT. The cyclone reached 17N 140E at 0000 UTC on the 24th before turning more southwest and passing west of 135E late on June 24, with maximum sustained winds of 55 KT with gusts to 70 KT.

Typhoon Tingting: Tingting entered OPC's map area near 16N 146E as a minimal typhoon while moving northwest, and developed maximum sustained winds as high as 80 KT with gusts to 100 KT when the center was near 19N 144E at 1800 UTC June 28. By month's end an approaching cold front from the northwest turned Tingting more to the north. By 1200 UTC July 1 the cyclone weakened to a tropical storm near 30N 144E with maximum winds of 55 KT with gusts to 70 KT, and began a turn toward the northeast. Tingting weakened to an extratropical gale (990 hPa) near 38N 156E at 0000 UTC July 4, and then re-intensified into a storm-force low with a central pressure as low as 980 hPa (***Figure 2***) near 48N 164E, where it stalled. Some ship observations

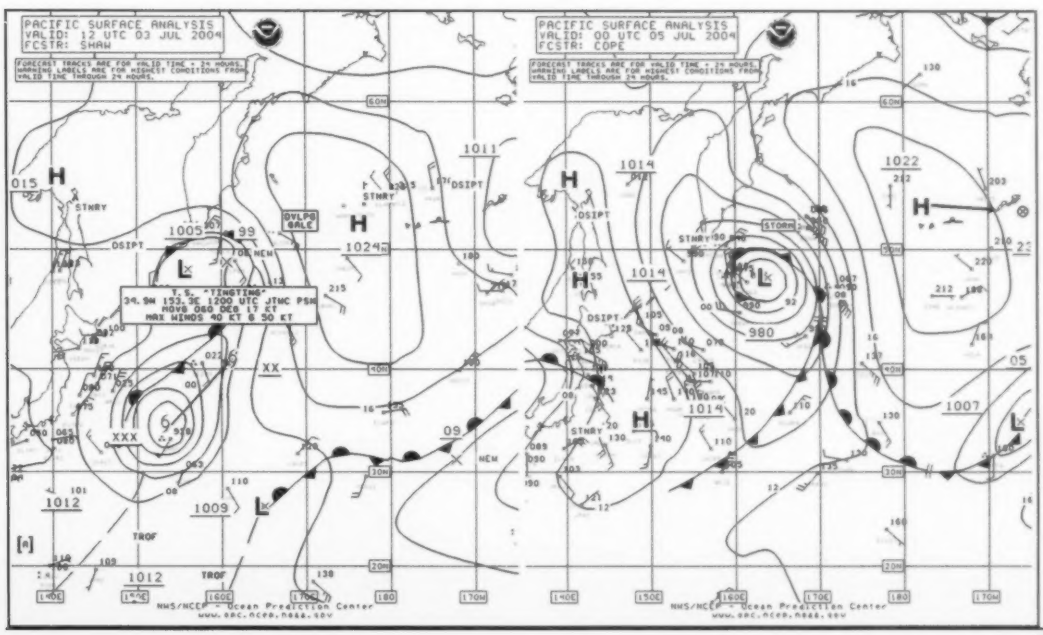


Figure 2. OPC North Pacific Surface Analysis charts (Part 2) valid 1200 UTC July 3 and 0000 UTC July 5, 2004. Tropical Storm Tingting is depicted becoming extratropical.

OBSERVATION	POSITION	DATE/TIME(UTC)	WIND	SEAS(m/ft)
Sea-Land Trader (KIRH)	35N 143E	02/0000	NE 40	8.0/26
Brooklyn Bridge (3EZJ9)	36N 143E	02/0000	N 40	6.0/20
Aichi Maru (JEGI)	29N 149E	02/0900	S 35	
Century Leader No. 3 (JADY)	33N 154E	03/0600	S 47	6.5/22
	33.5N 154E	03/1200	SW 50	

Table 1. Some notable ship observations taken during Tropical Storm Tingting.

taken during the passage of Tingting are listed in ***Table 1***. The second part of ***Figure 2*** shows only some ship reports of gale-force winds east of the front associated with extratropical Tingting, but the QuikScat image in ***Figure 3*** has a 50 KT wind barb near 45N 167E, supporting the classification of the system as a storm.

The strong low that was Tingting then remained stationary and weakened to below gale strength early on July 6, before becoming absorbed by a developing low passing to the south late on the same day.

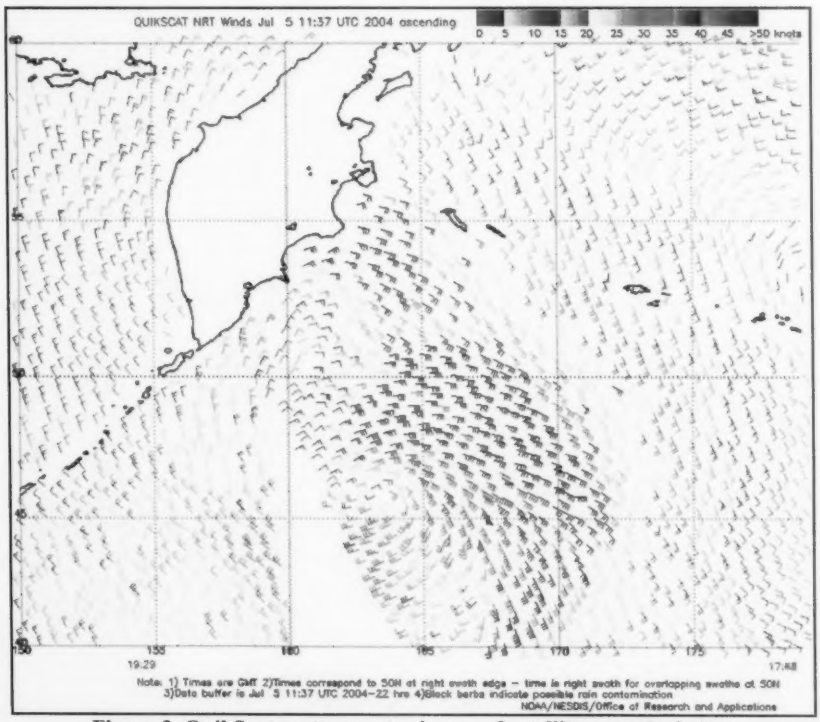


Figure 3. QuikScat scatterometer image of satellite-sensed winds valid 1748 UTC July 4, 2004, or about six hours prior to the valid time of the second part of *Figure 2*.

Image is courtesy of NOAA/NESDIS /Office of Research and Applications.

Typhoon Namtheun: Tropical Depression 13W formed near 23N 150E at 0600 UTC July 25 and moved northwest while rapidly intensifying, becoming Typhoon Namtheun only eighteen hours later near 25N 148E with maximum sustained winds of 65 KT with gusts to 80 KT. Namtheun attained a peak intensity of 115 KT sustained winds with gusts to 140 KT at 1800 UTC on the 26th when the center reached 27N 147E. Gradual weakening followed while the cyclone continued to move northwest, and Namtheun passed west of 135E, about 100 nmi south of Japan, as a strong tropical storm by month's end, implying maximum sustained winds of 60 KT with gusts to 75 KT. The **Bishu Maru** (JGAC) encountered southeast winds of 40 KT near 30N 140E and 31N 140E at 1800 UTC July 29 and 0000 UTC July 30, respectively. Namtheun later recurved northeast into the Sea of Japan and became extratropical west of northern Japan early on August 2, before becoming absorbed by a larger low inland over Asia on the 3rd.

Typhoon Meranti: Tropical Depression 14W formed near 19N 166E at 1800 UTC August 3 and intensified to a tropical storm six hours later while moving north. Tropical Storm 14W appears in the

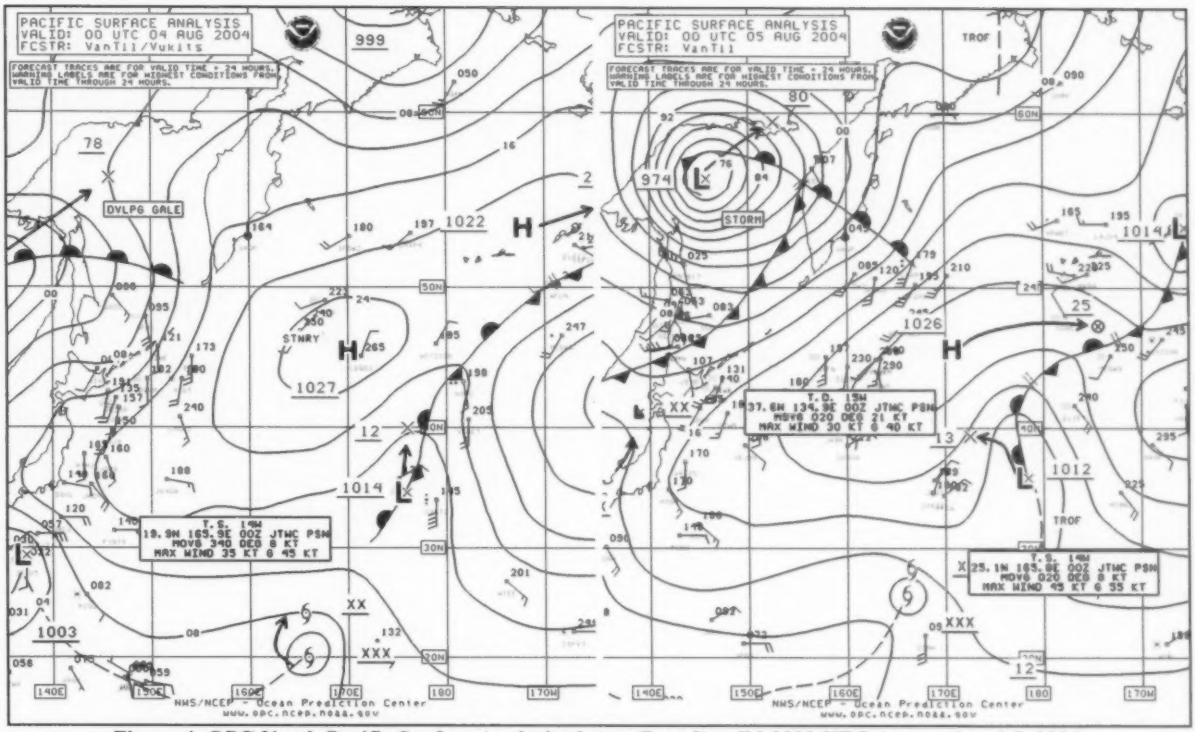


Figure 4. OPC North Pacific Surface Analysis charts (Part 2) valid 0000 UTC August 4 and 5, 2004.

lower part of ***Figure 4***. The cyclone was named Meranti near 26N 166E at 0600 UTC August 5 and it continued to strengthen, becoming a typhoon six hours later near 27N 167E with maximum winds of 65 KT with gusts to 80 KT. The peak intensity came at 1800 UTC August 5 near 28N 167E, with maximum sustained winds of 90 KT and gusts to 110 KT. The cyclone then weakened to a tropical storm twenty-four hours later while turning more northeast into OPC's high seas area (***Reference 2***), near 32N 170E. Meranti then continued to weaken and became extratropical near 38N 172E early on August 8, where it stalled and later became absorbed by a larger Bering Sea low by the 13th.

Tropical Depression 15W: This cyclone made a brief appearance, moving from west of the area into the Sea of Japan near 38N 135E at 0000 UTC August 5 (***Figure 4***) with maximum winds of 30 KT with gusts to 40 KT. The cyclone moved northeast and became extratropical, and was absorbed by a frontal system over northern Japan on the 5th.

Tropical Storm Malakas: A northeastward-moving weak low developed into Tropical Depression 17W at 1800 UTC August 10 near 25N 156E, and Tropical Storm Malakas six hours later near 27N 158E. Following a track similar to that of Meranti, Malakas remained a minimal tropical storm with maximum sustained winds of 35 KT and gusts to 45 KT, until becoming an extratropical gale near 33N 167E early on August 12. The low that was Malakas then moved north into the Bering Sea and became absorbed by a larger Bering Sea system by the 15th.

Tropical Depression 18W: This cyclone moved northwest to near 16N 143E at 0600 UTC August 14 with maximum winds 25 KT with gusts to 35 KT, and later passed west of 135E as a tropical depression early on the 15th.

Tropical Storm Megi: Megi moved northeast into the Sea of Japan early on August 19, to near 40N 136E at 1200 UTC on the 19th with maximum winds of 50 KT and gusts to 65 KT.

Megi then became an extratropical storm six hours later in the northern Sea of Japan with a central pressure of 985 hPa. ***Figure 5*** shows extratropical Megi as the 986 hPa compact storm crossing northern Japan. The **Humber Bridge** (JKRK) reported a southwest wind of 50 KT near 40N 150E at 1200 UTC August 20 while the storm center passed 150 nmi to the northwest. The system then tracked east-northeast and weakened to a gale about 400 nmi south of the western Aleutians late on the 21st, and later ended up near the Queen Charlotte Islands on August 24.

Super Typhoon Chaba: Chaba moved northwest into OPC's oceanic surface map area near 16N 141E early on August 23 as a super typhoon with maximum sustained winds of 155 KT and gusts to 190 KT, matching the intensity of Dianmu in June. Slow weakening followed, but the cyclone remained a super typhoon through 1200 UTC on the 25th, when the center was at 22N 137E. Typhoon Chaba then passed west of 135W, about 500 nmi south of Japan, at 1800 UTC August 26 with maximum winds of 110 KT and gusts to 135 KT. Chaba then passed over western Japan early on the 30th as a minimal typhoon before turning north into the Sea of Japan as a tropical storm. ***Figure 6*** shows Tropical Storm Chaba losing tropical characteristics and becoming the extratropical storm (977 hPa) in the second part of the figure, only twelve hours later. ***Table 2*** has a listing of some notable reports, mostly from ships, taken during the passage of Chaba.

Typhoon Songda: Rapidly intensifying Typhoon Songda appeared near 16N 150E at 1800 UTC August 30 while moving northwest, with maximum sustained winds of 95 KT and gusts to 115 KT. By month's end the cyclone was near 18N 147E with maximum winds up to 130 KT and gusts up to 160 KT. See ***Figure 6***. Also see the next issue of MWL (April 2005) for more information on this typhoon which persisted into September.

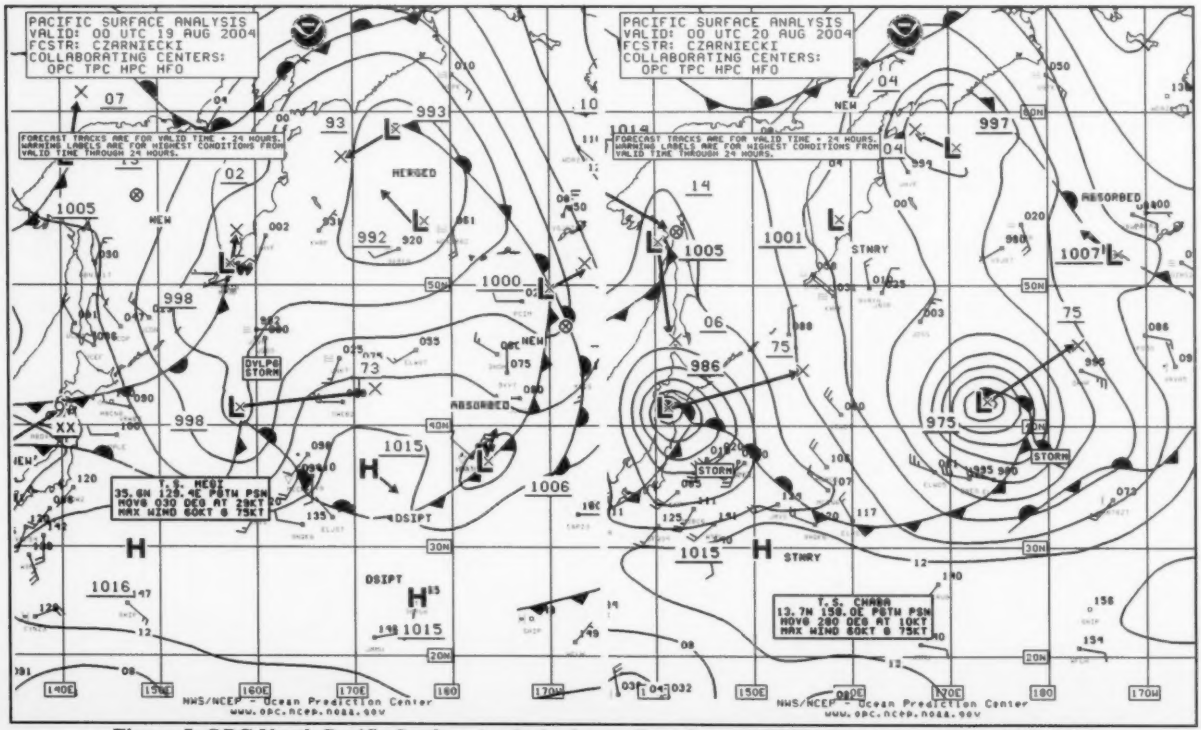


Figure 5. OPC North Pacific Surface Analysis charts (Part 2) valid 0000 UTC August 19 and 20, 2004.

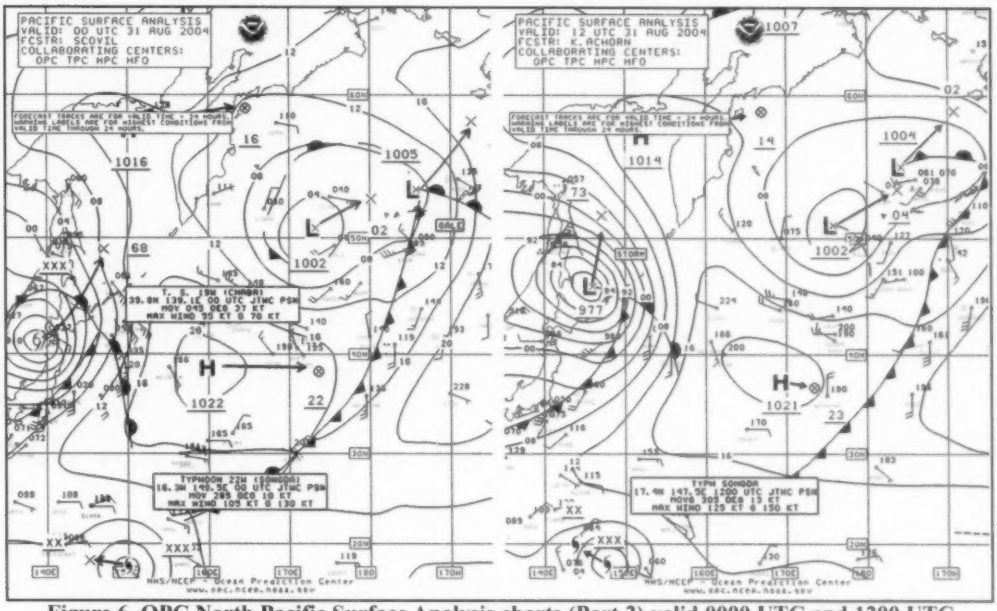


Figure 6. OPC North Pacific Surface Analysis charts (Part 2) valid 0000 UTC and 1200 UTC August 31, 2004. Tropical Storm Chaba is shown becoming an extratropical storm.

OBSERVATION	POSITION	DATE/TIME(UTC)	WIND	SEAS(m/ft)
Northwest Shearwater (ZCAO7)	28N 139E	28/1800	S 40	
Cho Yang Atlas (DQVH)	33N 134E	30/1200	S 50	12.0/39
OOCL Fedelity (VRWG5)	34N 139E	30/1800	S 45	
Polar Eagle (ELPT3)	34N 140E	31/0000	S 45	
Martorell (HPNE)	36N 143E	31/0000	S 40	5.0/16
Hanjin Pretoria (A8CP6)	41N 147E	31/1200	SW 35	7.5/25
Buoy 21600	33.5N 136.8E	30/1500	8.0/26	

Table 2. List of selected observations taken during passage of Tropical Cyclone Chaba.

Other Significant Events

Western North Pacific Storm, May 2–3: A low-pressure area moved east from near northern Japan early on May 1 and intensified into a storm near 45N 165E with a 981 hPa central pressure at 1200 UTC May 2, before looping to the southeast. The central pressure reached 979 hPa as the center crossed 43N 167E at 0600 UTC on the 3rd. The ship **Sea-Land Racer** (MCDW2) (40N 162E) encountered northwest winds of 45 KT at that time. The system then drifted east and weakened.

Northwest Pacific Storm of August 4–5: This system developed from a frontal wave of low pressure inland over northeast China late on August 3 and rapidly intensified into the 974 hPa storm shown in the Sea of Okhotsk (***Figure 4***). The cyclone was deepest six hours later when the center was analyzed with a 973 hPa central pressure, unusually intense for early August. The QuikScat image of the storm in ***Figure 7*** was even more impressive, showing winds of 50 to as high as 80 KT north and northwest of the center at a time several hours before the valid time of the second part of ***Figure 4***. It is very unusual to get hurricane-force winds in a non-tropical system in summer. The **Sioux** (WBN7617) reported west winds of 52 KT near 51N 144E at 2100 UTC August 4. Another ship, **UCEF,** encountered south winds of 50 KT near 57N 156E fifteen hours later. This storm was short-lived, and moved quickly into eastern Russia and weakened rapidly by August 6.

Western North Pacific Storm of August 19–20: ***Figure 5*** depicts this development which was relatively far south for late summer, at the latitude of Japan. The 998 hPa low near 41N 158E deepened 23 hPa in 24 hours, resulting in the relatively compact 975 hPa storm in the second part of ***Figure 5***. Ship reports were sparse in the area. The cyclone then deepened slightly to 973 hPa in the following twenty-four hours while turning northeast, but winds decreased to gale force as the circulation of the low expanded in area. The system then stalled near the central Aleutians and weakened late on August 21. ⚓

References

1. From Tropical Prediction Center website, www.nhc.noaa.gov/; and also Pasch, Richard J. and Lawrence, Miles B., *Atlantic Hurricanes* (Weatherwise, March/April 2003).

2. Bancroft, G. and Sienkiewicz, J., *High Seas Text Bulletins Issued by MPC* (Mariners Weather Log, Summer 1996).

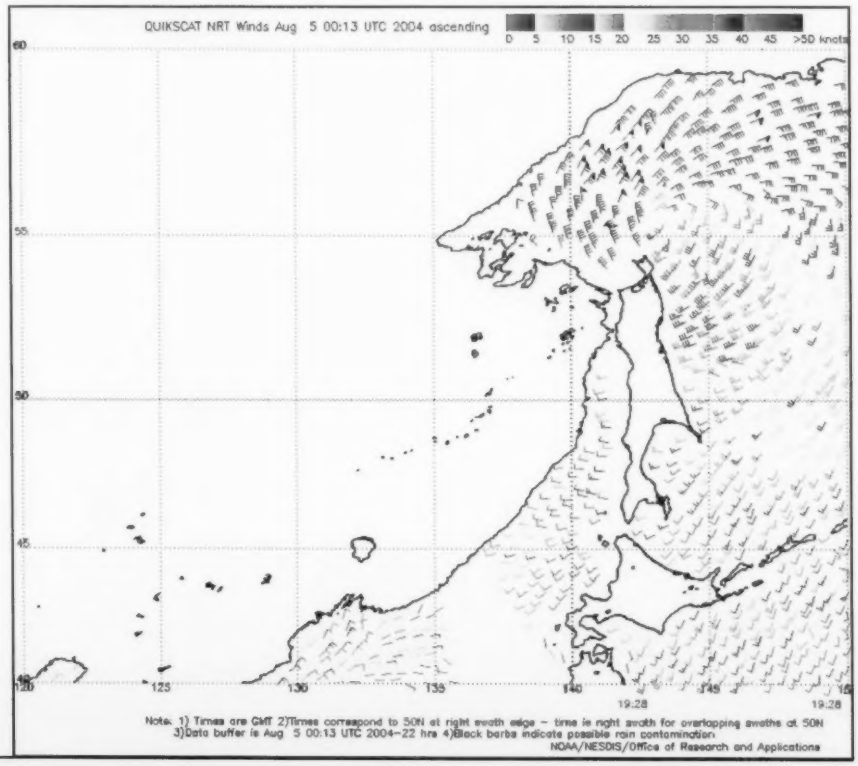


Figure 7. QuikScat scatterometer image of satellite-sensed winds around the storm shown in *Figure 5*. The valid time of the pass is 1928 UTC August 4, 2004, or about four and one-half hours prior to the valid time of the second part of *Figure 5*.
Image is courtesy of NOAA/NESDIS /Office of Research and Applications.

MEAN CIRCULATION HIGHLIGHTS AND CLIMATE ANOMALIES
May through August 2004

A. James Wagner, Senior Forecaster, Climate Operations Branch, Climate Prediction Center /NCEP/NWS/NOAA.

MAY–JUNE 2004

The circulation pattern over the Northern Hemisphere during May and June was characterized by generally above normal 500 hPa heights and sea level pressure over much of the Arctic Basin and across the North Pacific. A moderately amplified wave train prevailed from the East Coast of the U.S. across the Atlantic and most of Asia, with ridges over the Atlantic Coast of North America, the extreme eastern Atlantic Ocean, and central Russia, while troughs occupied the intervening positions. An extensive area of below normal 500 hPa heights covered much of Canada and the north-central U.S.

Although both months were unusually warm over Alaska, only May was mostly warm over the Lower 48 States with the exception of the northern border from Montana to upper Michigan. Convective activity and severe weather was frequent in the Midwest near the frontal boundary separating the cool and warm air. The ridge over Alaska moved somewhat further to the north in June, while the ridge over the southeastern U.S. weakened, allowing the downstream trough over the Lower 48 States to spread below normal temperatures to the south and east. An increase in convective activity from the southern Great Plains eastward across most of the South also contributed to the cooler conditions by lowering maximum temperatures due to increased cloudiness and wet ground.

Elsewhere, the ridge over the eastern Atlantic was related to an early summer heat wave over Spain, but the heat did not increase or persist throughout the summer in western Europe as it did the previous year.

Several typhoons were active in the southwestern part of the Pacific, where there were deep easterlies and relatively low westerly shear to the south of the subtropical ridge.

JULY–AUGUST 2004

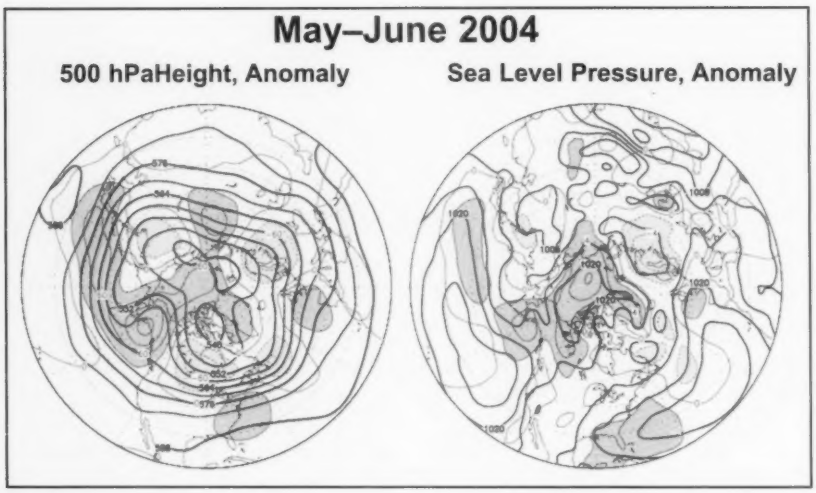
During the high summer months of July and August, the abnormally strong ridge persisted over Alaska, leading to the warmest and one of the driest summers on record in many locations and contributing to a serious and prolonged outbreak of wildfires in the interior of the state. Relatively strong westerlies broke across the northern Pacific to the south of this ridge. A moderately amplified wave train prevailed from the Pacific Northwest across the Atlantic and most of Eurasia, with a ridge over the northern Great Basin and a broad and unusually strong trough centered over the Mississippi Valley.

Only the western part of the Lower 48 States was warmer than normal during July and August, while the area of below normal temperatures continued to expand and covered most areas east of the Continental Divide by late summer. The anomalous trough centered over the upper Mississippi Valley strengthened and expanded in area, pushing the remnants of the southeastern ridge out to the Canadian Maritimes. A relatively deep mean trough was located over the eastern Atlantic both at the surface and aloft, providing cool and somewhat wetter than normal weather. This was a welcome change from the previous summer's deadly record heat wave.

THE TROPICS

Recurrent Madden-Julian Oscillation (MJO) waves originating over the Indian Ocean triggered bursts of convective activity over that area and the western Pacific, setting off several Kelvin Waves in the equatorial Pacific Ocean. These eventually contributed to a gradual warming of the surface waters over the central Pacific so that by the end of August the criteria for the establishment of weak El Nino conditions had been met. Due to the seasonal cycle of temperatures over the eastern equatorial Pacific, the temperatures were not high enough to trigger anomalous convection often seen in stronger events. Throughout most of the summer, convection was concentrated along a pronounced ITCZ near 10N.

Several typhoons were active over the southwestern Pacific, where tropical cyclone development continued to be favored by deep easterlies. Most of the storms remained at low latitudes affecting the Philippines and China, but one struck Japan at the end of August.



The Atlantic hurricane season was a little slow to get underway, but it quickly became very active with seven named storms developing during August, in addition to the first one that formed at the end of July. Conditions were unusually favorable for tropical cyclogenesis in the Atlantic, where widespread areas of above normal sea surface temperature (SST) were located under regions of low westerly shear in the troposphere. The stronger than normal ridge over the Canadian Maritimes helped to steer many of these storms westward into the southeastern U.S., where an area of slightly below normal sea level pressure reflects this activity.

In contrast, tropical activity was less active than usual over the eastern Pacific, while the Summer Monsoon was active in Mexico but relatively weak and deflected east of the Continental Divide in the United States.

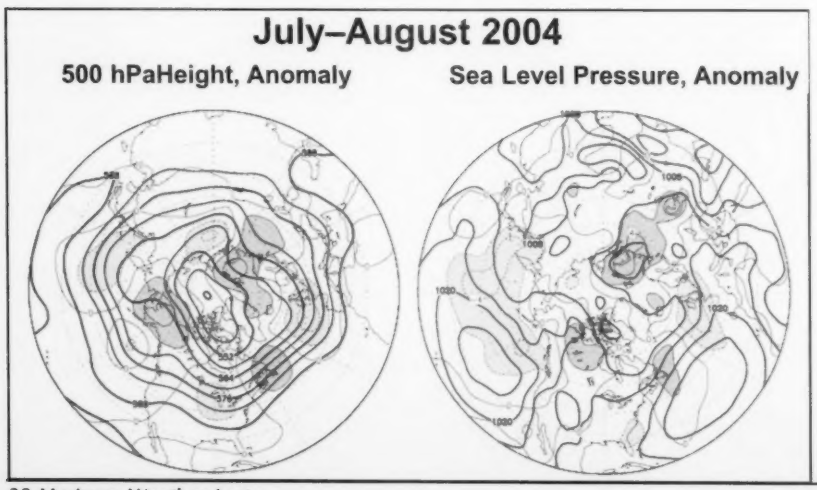


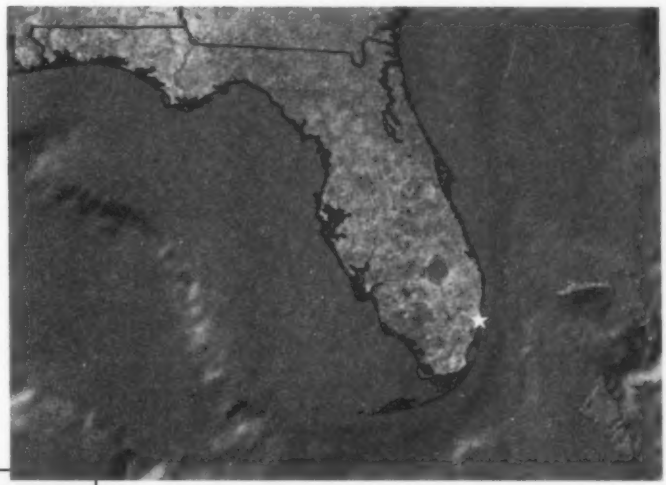
Figure legends and description of units:

The charts on the left shows the seasonal mean 500 hPa height contours at 60 m intervals in heavy solid lines, with alternate contours labeled in decameters (dm). Positive height anomalies are contoured in light solid lines at 30 m intervals, and light dashed lines show negative height anomalies. Areas of mean height anomalies more than 30 m above normal have heavy shading, and areas of mean height anomalies more than 30 m below normal have light shading.

The charts on the right show the seasonal mean sea level pressure (SLP) at 4 hPa intervals in heavy solid lines, labeled in hPa at selected intervals. Anomalies of SLP are contoured in light lines at 2 hPa intervals, with dark shading and solid lines in areas more than 2 hPa above normal, and light shading with dashed lines in areas greater than 2 hPa below normal. ⚓

NEW PORT METEOROLOGICAL OFFICER (PMO) in SOUTHERN FLORIDA

With the retirement of Mr. Bob Drummond, the VOS program had a hard task ahead in filling the vacancy at Port Everglades. Wanted—one fun loving, independent minded weather guesser, looking for serious shipboard interaction, and a love of palm trees and beach music. After all the screening processes were complete, Ms. Peggy Alander was selected as our newest PMO for Port Everglades.



Peggy arrived at Port Everglades via Goodland, Kansas where she worked as a Hydrometeorological Technician for the National Weather Service. Prior to her duty in Kansas, Peggy has over 20 years experience as a meteorologist in the US Navy. Although not a stranger to Florida with tours at Jacksonville and Key West, Peggy has extensive sea experience onboard the USNS John Lenthal, USNS Leroy Grumman, USS Comte De Grasse, USS Merrimack, and the USCGC Dallas. Other assignments included Keflavik Iceland, Guam, and Rota Spain.

Peggy holds a Masters Degree in Aeronautical Science with specialties in Aerospace Safety and Operations from Embry-Riddle Aeronautical University, and is still happily married to her husband Steve. They have 2 children - Amanda and Jacob. ⚓

Alaska Regional News

August 2004

August brought another all time monthly record high of 4,024 BBXX observations. This is the first time the Alaska monthly count has ever gone above 4,000. Alaska VOS ships are continuing their record pace for transmitting BBXX observations with 22,335 during the first 8 months of 2004 which is at a pace that is 49.1% higher compared to the first 8 months of our previous record year of 2003. The Tug **Seneca** was the August Alaska Ship of the Month with an all time Alaska monthly record of 489 BBXX transmitted. This marks the first time an Alaska VOS Ship has ever gone above the 300 or 400 mark in a single month. The Tug **Pacific Challenger** was dueling with the **Seneca** for much of the month for the BBXX Lead until their computer failed. They finished August with an outstanding total of 369 BBXX. The **Polar Eagle** remains in 1st place for 2004 with 1,444 BBXX which is 67% more than they had at this same point last year.

Pictured here from left to right 3rd Mate Doug Voss, 2nd Mate Mike Coffey, Chief Mate Dan Lunny The Midnight Sun set a new ship's Monthly Record for weather observations in September of 2004 with 143 BBXX. This was also the most BBXX in one month so far by any of the 10 container ships that come to Anchorage Alaska. This brought their total to 542 BBXX after the first 9 months of 2004.

This photograph was taken by Anchorage Port Meteorological Officer Larry Hubble who recently traveled with the crew in the Gulf of Alaska.

September 2004

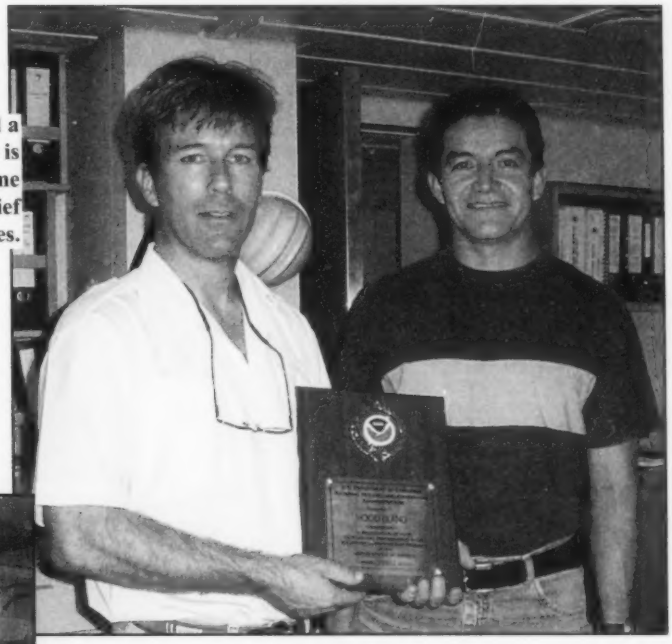
BBXX ship observations set another new all time record for the year with 26,396. The previous record was 23,823 in 2003. With 3 months left to go, Alaska is projected to get close to 35,000 BBXX in 2004. This is at pace that is 51.8% higher than 2003. Alaska VOS ships achieved a new September record of 3,589 BBXX observations in September. The Tug **Pacific Challenger** was the September Alaska Ship of the Month with 241 BBXX transmitted. The LNG Tanker **Polar Eagle** remains in 1st place for 2004 with 1,640 BBXX which is 57.5% more than they had at this same point last year. Crowley Maritime is the leading company supplying weather observations to Alaska this year so far providing 17% of Alaska's total. They have 20 Tugs that have transmitted weather observations to Alaska this year. WSO Valdez has transmitted 87 Satellite Phone ship observations so far since their phone was installed in late August. ⚓

Alaska Top BBXX Reporting Vessels January - September, 2004

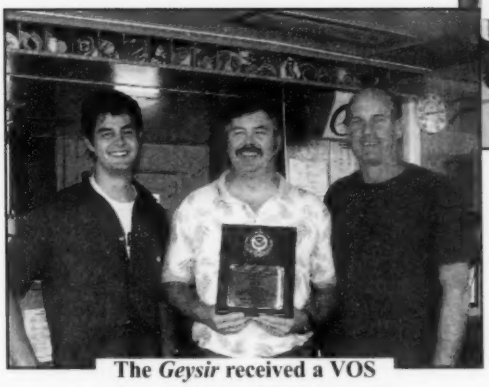
1. Polar Eagle ELPT3 - 1640
2. Pacific Challenger WDA3588 - 1583
3. Arctic Sun ELQB8 - 1553
4. Seneca WBN8469 - 1149
5. Sinuk WCQ8110 - 909
6. Jag Prakash AUBK - 840
7. Seabulk Montana WCW9126 - 827
8. Horizon Anchorage KGTX - 771
9. Paragon WDA2311 - 702
10. Tustumena WNGW - 687

All Alaska JAN - SEP 2004 - 26,396

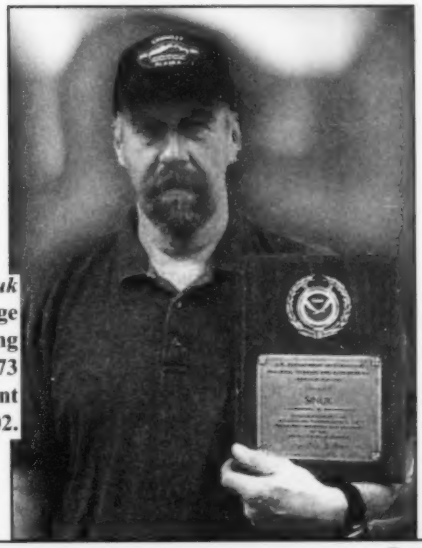
VOS Program Awards



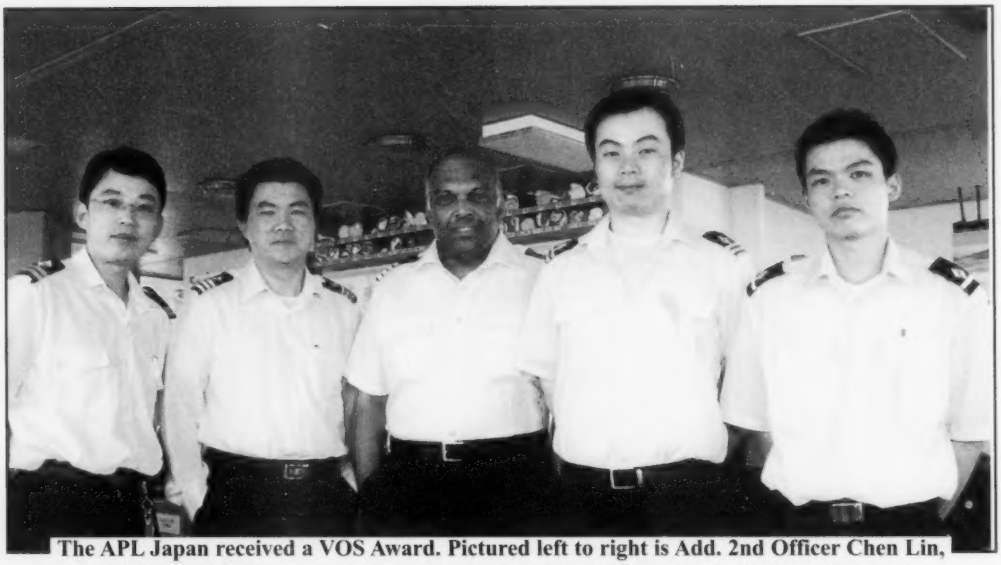
The *Hood Island* received a VOS Award. On the left is Captain J.P. Van Hamme and on the right is Chief Mate Gonzalo Cifuentes.



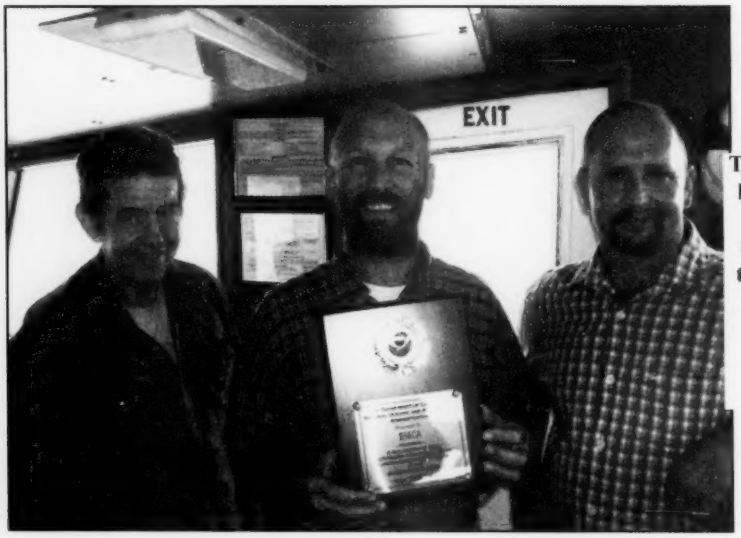
The *Geysir* received a VOS award. Pictured left to right are 2nd Mate James B. Cramdom, Captain Keith W. Schultz, and Chief mate Jerel W. Chamberlain.



Captain Bernie Meier of the Crowley Tug *Sinuk* receiving his 2003 VOS Award while in Anchorage Alaska on July 23, 2004. The *Sinuk* was the leading tug of any operating in Alaska waters with 973 weather observations for 2003. This was 121 percent more observations than they took in 2002.

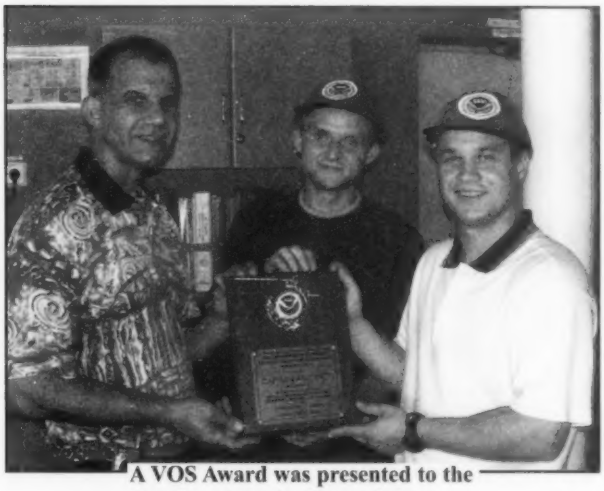


The APL Japan received a VOS Award. Pictured left to right is Add. 2nd Officer Chen Lin, Chief Officer Cheong Kwee Thiam, Master Captain S.K. Menon. 2nd Officer Zheng Yi, 3rd Officer Chin Chow Yien.



The *Seneca* received their fourth consecutive yearly VOS Award while at the Port of Anchorage on August 26, 2004. The *Seneca* took 723 weather observations in 2003, and have already achieved their best ever total of 1094 weather observations in 2004, with over 2 months left to go this year. From left to right is 2nd Mate Neil Sandvik, Captain Stephen Lundgren, and Chief Mate Michael Tarbox.

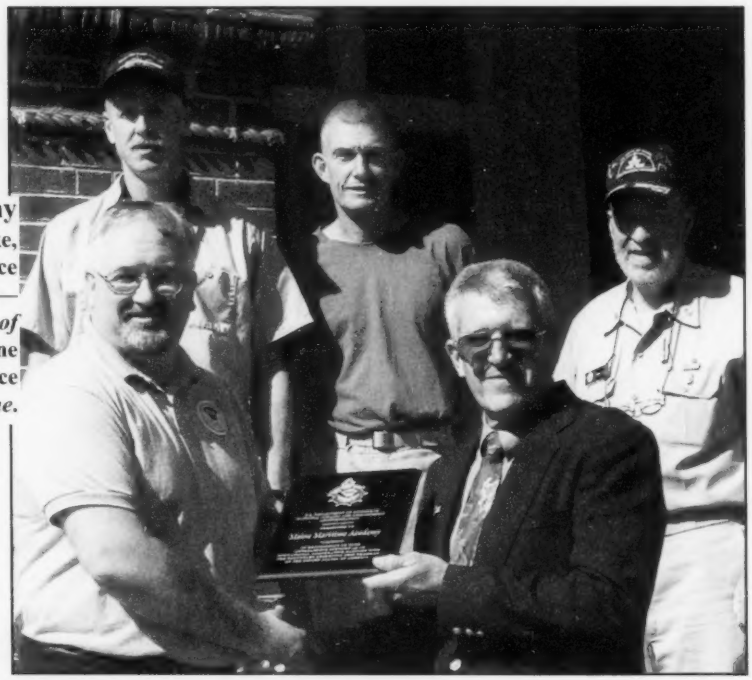
The *Navigator of the Seas* received a VOS Award. The award was presented by Miami PMO Peggy Alander (on right). Captain Rick Sullivan (on left) and 1st Officer Simon Lebrun (center) received the award.



A VOS Award was presented to the *Cap San Antonio*. Shown left to right are PMO Pete Gibino presenting the award to Deck Cadet Walaxzek Piotr and Third Mate Piekart Jaroslqw.

VOS Educational Cooperative Partner Awards

Maine Maritime Academy, Massachusetts Maritime Academy, State University of New York Maritime College, and Texas Maritime Academy were recently honored for their efforts as Educational Cooperative partners with the Voluntary Observing Ship (VOS) program. The VOS program congratulates the Instructors, Masters, and Mates who assisted us in ensuring that their cadets received real hands-on training in weather observing practices and policies. Thanks to all, and we look forward in supporting each other in the years to come.



Maine Maritime Academy
Pictured (left to right) front—Robert Luke, VOS Program Lead. Dr. John Barlow, Vice President for Academic Affairs, back—Brendan McAvoy, Chief Mate, *T/S State of Maine*, Michael Carr, Instructor of Marine Transportation, and Captain Laurence Wade, Master, *T/S State of Maine*.

Massachusetts Maritime Academy
Pictured left to right Captain Bradley Lima, Academic Vice President, Robert Luke, VOS Program Lead, Commodore Rick Gurnon, Executive Vice President and Acting President, and Jim Luciani, New York Port Meteorological Officer.

State University of New York Maritime College

Pictured left to right are Jim Luciani, New York Port Meteorological Officer, Tony Manzi, Assistant Professor of Meteorology, and Robert Luke, VOS Program Lead.

Texas Maritime Academy

Pictured left to right are Chief Mate Buddy Blackburn, 4th Cadet Gabriel Ashworth, 4th Cadet Nathan Corgey, and 2nd Cadet Andy Yates.

National Weather Service VOS Program New Recruits From July 1, 2004 through October 31, 2004

Name of Ship	Call	Agent Name	Recruiting PMO
ALASKAN FRONTIER	WDB7815	ALASKAN FRONTIER C/O ALASKA TANKER COMPANY	VALDEZ, AK
ALASKAN LEADER	WDB7918	ALASKAN LEADER C/O STERLING SERVIS	KODIAK, AK
AMSTERDAM	PBAD	AMSTERDAM HOLLAND AMERICA	ANCHORAGE, AK
ARCTIC BEAR	WPB3396	ARCTIC BEAR C/O NWS KODIAK	KODIAK, AK
BARROW RESEARCH	KCB53	BARROW RESEARCH C/O NWS	ANCHORAGE, AK
BIG VALLEY	WCX5558	BIG VALLEY	KODIAK, AK
BILLIE H.	WCY4992	BILLIE H. C/O NORTHLAND SERVICES	KODIAK, AK
BUCCANEER	WYW5588	BUCCANEER	KODIAK, AK
BULWARK	WBN4113	BULWARK C/O CROWLEY ALASKA	VALDEZ, AK
CAJUN EXPRESS	ELXL3	TRANSOCEAN	HOUSTON, TX
CANMAR PROMISE	ELXZ9	CANMAR PROMISE C/O ALASKA MARITIME AGENCY	ANCHORAGE, AK
CAP DOUKATO	A8EW3	HARTMANN SCHIFFARTS GMBH &CO	CHARLESTON, SC
CARIBBEAN PRINCESS	ZCDG8	CARIBBEAN PRINCESS C/O ALASKA MARITIME	ANCHORAGE, AK
CELINE	HBEF	ENZIAN SHIPPING AG	NEW YORK CITY, NY
COLD BAY RESEARCH	KCI95	COLD BAY RESEARCH C/O NWS	ANCHORAGE, AK
COLLIER BROTHERS	WUU7551	COLLIER BROTHERS C/O WESTERN ALASKA FISHERIES	KODIAK, AK
CORAL PRINCESS	ZCDF4	CORAL PRINCESS ALASKA MARITIME	ANCHORAGE, AK
CORWITH CRAMER	WTF3319	CORWITH CRAMER SEA EDUCATION ASSOCIATION	KODIAK, AK
DAWN PRINCESS	ZCBU2	DAWN PRINCESS C/O ALASKA MARITIME AGENCY	ANCHORAGE, AK
DEEPWATER PATHFINDER	HP9216	TRANSOCEAN	HOUSTON, TX
DELAWARE BRIDGE	V2OE2	WALTER PENNY (TF MARINE)	NEW YORK CITY, NY
DEVELOPMENT DRILLER 1	YJSW5	GLOBAL SANTAFE CORP	HOUSTON, TX
DIAMOND PRINCESS	ZCDF8	DIAMOND PRINCESS ALASKA MARITIME	ANCHORAGE, AK
EMMA FOSS	WCF3931	EMMA FOSS C/O FOSS MARITME	KODIAK, AK
EOS I	P3BA7		SEATTLE, WA
FESTA	3EBP8		SEATTLE, WA
GALILEO	SXAC	ATLANTIC BULK CARRIERS LTD	NEW ORLEANS, LA
GOLDEN PRINCESS	ZCDA9	GOLDEN PRINCESS C/O ALASKA MARITIME	ANCHORAGE, AK
GRAND PRINCESS	ZCBU5	GRAND PRINCESS	ANCHORAGE, AK
HALLE FOSS	WCF3930	HALLE FOSS C/O FOSS MARITIME	KODIAK, AK
HUDSON LEADER	H9JS		SEATTLE, WA
INDEPENDENT VENTURE	A8CG2		BALTIMORE, MD
INDOTRANS CELEBES	VRZN8	CAPES SHIPPING AGENCIES CO. INC.	NORFOLK, VA
INDUSTRIAL CENTURY	V2OJ1	JUNGERHANS MARITIME SERVICES GMBH & CO. KG	NEW ORLEANS, LA

Name of Ship	Call	Agent Name	Recruiting PMO
INLET RESEARCH	KEC43	INLET RESEARCH C/O NWS	ANCHORAGE, AK
ISLAND MIST	WBB4732	ISLAND MIST C/O NWS KODIAK	KODIAK, AK
ISLAND PRINCESS	ZCDG4	ISLAND PRINCESS	ANCHORAGE, AK
JAG PRACHI	ATPN	RILEY SHERMAN SHIPPING AGENCY	NEW ORLEANS, LA
KATHERINE	WUS5485	KATHERINE	KODIAK, AK
KOTZEBUE RESEARCH	KUU619	KOTZEBUE RESEARCH C/O NWS	ANCHORAGE, AK
LAZY BAY	WDB8266	LAZY BAY	KODIAK, AK
LESLIE LEE	WYC7933	LESLIE LEE	KODIAK, AK
LINDEN PRIDE	H3VP		HOUSTON, TX
LNG ARIES	V7BW7	PRONAV SHIP MANAGEMENT	NEW YORK CITY, NY
LNG CAPRICORN	V7BW8	PRONAV SHIP MANAGEMENT	NEW YORK CITY, NY
M/V ASPHALT COMMANDER	WFJN	SARGEANT MARINE, INC	NEW ORLEANS, LA
M/V GSF EXPLORER	WCX5333	OIM - GSF EXPLORER	NEW ORLEANS, LA
MABEL RICKMERS	V7EO5	RANDY HERBERT	NEW YORK CITY, NY
MAIA H.	WYX2079	MAIA H. C/O NORTHLAND SERVICES	KODIAK, AK
MARCY J	WCF4791	MARCY J	KODIAK, AK
MAUNAWILI	WDB7104	MATSON NAVIGATION CO.	NEW YORK CITY, NY
MECTA SEA	C6PJ3	ELMIRA SHIPPING & TRADING S.S/ATHENS, GREECE	NEW ORLEANS, LA
MSC NURIA	3FIE6	MSC (USA) INC	NEW YORK CITY, NY
NANUQ	WCQ8100	NANUQ C/O CROWLEY ALASKA INC.	VALDEZ, AK
NEW JERSEY RESPONDER	WBO8578	MRSC	NEW YORK CITY, NY
NORDFALCON	P3KC8	RENAISSANCE SHIPPING AGENCY	NEW YORK CITY, NY
OCEAN CONFIDENCE	V7EA2	DIAMOND OFFSHORE	HOUSTON, TX
OCEAN SARATOGA	V7EB3	DIAMOND OFFSHORE	HOUSTON, TX
OCEAN STAR	V7EB6	DIAMOND OFFSHORE	HOUSTON, TX
OCEAN VALIANT	V7EB7	DIAMOND OFFSHORE DRILLING	HOUSTON, TX
OOCL AMERICA	VRWE8		SEATTLE, WA
OOSTERDAM	PBKH	OOSTERDAM HOLLAND AMERICA	ANCHORAGE, AK
P&O NEDLLOYD CARIBBEAN	P3TN9	BARWIL ASCA	NEW YORK CITY, NY
PACIFIC PRINCESS	ZDDY7	PACIFIC PRINCESS ALASKA MARITIME	ANCHORAGE, AK
PACIFIC STAR	WCW7740	PACIFIC STAR C/O NWS KODIAK	KODIAK, AK
PATHFINDER	WBN8467	PATHFINDER C/O CROWLEY ALASKA INC.	VALDEZ, AK
PATRIOT	NL9WX	OCEAN WARRIOR C/O NWS	KODIAK, AK
POLAR ADVENTURE	WAZV	POLAR TANKERS INC. C/O WAYNE BRANDENBURGER	NEW ORLEANS, LA
PRINSENDAM	PBGH	PRINSENDAM C/O HOLLAND AMERICA	ANCHORAGE, AK
PURITAN	ZCHD9		MIAMI, FL
RAINBOW QUEST	VRVZ2	RAINBOW QUEST C/O ALASKA MARITIME AGENCY	ANCHORAGE, AK
REGAL PRINCESS	MZCE9	REGAL PRINCESS C/O ALASKA MARITIME	ANCHORAGE, AK
RHINE FOREST	V7EI9	LMS MANAGEMENT	NEW ORLEANS, LA
RICKMERS HAMBERG	V7DS3	COLUMBIA SHIPMANAGEMENT	NEW ORLEANS, LA

Name of Ship	Call	Agent Name	Recruiting PMO
ROBERT C. SEAMENS	WDA4486	ROBERT C. CEAMENS C/O NWS KODIAK	KODIAK, AK
ROTTERDAM	PDGS	ROTTERDAM C/O HOLLAND AMERICA	ANCHORAGE, AK
S/R HINCHINBROOK	WDA3143	S/R NINCHINBROOK C/O NWS	VALDEZ, AK
SAM M. TAALAK	WCX5321	SAM M. TAALAK C/O NWS KODIAK	KODIAK, AK
SAPPHIRE PRINCESS	ZCDG7	SAPPHIRE PRINCESS ALASKA MARITIME	ANCHORAGE, AK
SEA PRINCESS	MZLT2	SEA PRINCESS C/O ALASKA MARITIME	ANCHORAGE, AK
SEA VOYAGER	WCX9106	SEA VOYAGER C/O CROWLEY ALASKA INC.	VALDEZ, AK
SEALAND INTREPID	V7BA2		SEATTLE, WA
SEALAND LIGHTING	S6EA		SEATTLE, WA
SEARIVER BAYTOWN	KFPM	SEARIVER BAYTOWN	VALDEZ, AK
SKY PRINCESS	GYYP	SKY PRINCESS C/O ALASKA MARITIME AGENCIES	ANCHORAGE, AK
ST PAUL RESEARCH	KEY796	ST PAUL ISLAND RESEARCH C/O NWS	ANCHORAGE, AK
STAR JAPAN	LAZV5	GRIEG BILLABONG AS	BALTIMORE, MD
STAR PRINCESS	ZCDD6	STAR PRINCESS C/O ALASKA MARITIME	ANCHORAGE, AK
SUN PRINCESS	ZCBU6	SUN PRINCESS C/O ALASKA MARITIME AGENCY	ANCHORAGE, AK
SYNERGY	NL9H	SYNERGY	KODIAK, AK
TAHITIAN PRINCESS	ZDDY8	TAHITIAN PRINCESS C/O ALASKA MARITIME	ANCHORAGE, AK
UBC SVEA	P3JA8		SEATTLE, WA
USCGC DECISIVE	WMEC		NEW ORLEANS, LA
USCGC HOLLYHOCK	NHHF	USCGC HOLLYHOCK	CHICAGO, IL
USCGC KUKUI (WLB 203)	NJKS	USCGC KUKUI (WLB 203)	KODIAK, AK
USNS PILILAAU	NBWY	USNS PILILAAU (T-AKR 304)	NEW ORLEANS, LA
VALIANT	E7EB7	VALIANT C/O NWS KODIAK	KODIAK, AK
VOLENDAM	PCHM	VOLENDAM HOLLAND AMERICA	ANCHORAGE, AK
WESTERDAM	PINW	WESTERDAM C/O HOLLAND AMERICA	ANCHORAGE, AK
YM GENOVA II	ELVX2	B &R AGENCIES	NEW YORK CITY, NY
ZIM PANAMA	VSWW5	ZIM-AMERICAN ISRAELI SHIPPING CO	MIAMI, FL
ZUIDERDAM	PBIG	ZUIDERDAM C/O HOLLAND AMERICA	ANCHORAGE, AK

102 New Recruits—Way to Go and Welcome Aboard!–Luke

VOS Cooperative Ship Report: January through October 2004

Ship Name	Call	Port	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
ALASKA MARINER	WSM5364	Anchorage	1	0	0	10	0	0	0	0	3	0	0	0	14
AMSTERDAM	PBAD	Anchorage	0	0	0	0	0	0	0	0	0	26	0	0	26
ARCTIC SUN	ELQB8	Anchorage	187	174	168	183	82	96	196	176	190	183	0	0	1635
AVIK	WDB7888	Anchorage	0	0	0	0	0	9	4	5	19	14	0	0	51
BARROW RESEARCH	KCB53	Anchorage	0	0	0	0	0	0	8	27	25	21	0	0	81
BRUCE	WWU8	Anchorage	36	23	26	25	28	24	23	24	25	19	0	0	253
CANMAR DYNASTY	VSXC4	Anchorage	0	0	0	0	0	0	0	4	25	13	0	0	42
CANMAR PROMISE	ELXZ9	Anchorage	0	0	0	0	0	0	0	57	44	76	0	0	177
CARIBBEAN PRINCESS	ZCDG8	Anchorage	0	0	0	0	0	0	0	0	0	8	0	0	8
COLD BAY RESEARCH	KCI95	Anchorage	0	0	0	0	0	0	2	4	2	0	0	0	8
DAWN PRINCESS	ZCBU2	Anchorage	0	0	0	0	0	0	0	18	10	17	0	0	45
DIAMOND PRINCESS	ZCDF8	Anchorage	0	0	0	0	0	0	0	0	0	48	0	0	48
GALE WIND	WAZ9548	Anchorage	1	2	7	4	12	9	12	12	14	10	0	0	83
GLADIATOR	WBN5982	Anchorage	0	0	0	0	13	8	0	0	0	0	0	0	21
GRAND PRINCESS	ZCBU5	Anchorage	0	0	0	0	0	0	0	0	0	2	0	0	2
GUARDIAN	WBO2511	Anchorage	0	0	0	0	1	0	0	0	10	0	0	0	11
GUARDSMAN	WBN5978	Anchorage	67	73	72	34	24	44	23	13	0	1	0	0	351
GULF TITAN	WDA5598	Anchorage	7	8	9	8	11	5	2	5	10	20	0	0	85
HORIZON ANCHORAGE	KGTX	Anchorage	90	43	81	94	66	54	103	91	94	343	0	0	1059
HORIZON KODIAK	KGTZ	Anchorage	45	50	82	94	86	74	86	39	62	67	0	0	685
HORIZON TACOMA	KGTY	Anchorage	52	68	54	44	51	31	40	65	53	52	0	0	510
INLET RESEARCH	KEC43	Anchorage	0	0	0	0	0	0	0	0	8	4	0	0	12
ISLAND CHAMPION	WCZ7046	Anchorage	0	0	0	0	0	0	0	6	11	0	0	0	17
ISLAND PRINCESS	ZCDG4	Anchorage	0	0	0	0	0	0	0	0	9	55	0	0	64
ISLAND WARRIOR	WDA9217	Anchorage	0	0	0	0	0	0	0	13	0	0	0	0	13
JAG PRAKASH	AUBK	Anchorage	87	85	121	102	90	75	63	97	87	40	0	0	847
KOTZEBUE RESEARCH	KUU619	Anchorage	0	0	0	0	0	0	0	25	20	18	0	0	63
LYKES EAGLE	VSUA7	Anchorage	12	5	51	28	24	13	7	6	28	33	0	0	207
NAVIGATOR	WBO3345	Anchorage	0	0	0	0	48	70	15	35	40	3	0	0	211
NOAA SHIP FAIRWEATHER	WTEB	Anchorage	0	0	0	0	0	0	1	0	0	0	0	0	1
OCEAN MARINER	WCF3990	Anchorage	1	0	0	0	0	0	27	5	0	1	0	0	34
OCEAN RANGER	WAM7635	Anchorage	0	4	5	1	4	0	0	0	20	23	0	0	57
OOSTERDAM	PBKH	Anchorage	0	0	0	0	0	0	0	0	0	1	0	0	1
PACIFIC PRINCESS	ZDDY7	Anchorage	0	0	0	0	0	0	0	0	8	18	0	0	26
PANDALUS	WAV7611	Anchorage	0	0	1	0	0	1	0	0	0	0	0	0	2
POINT BARROW	WBM5088	Anchorage	0	0	0	0	22	16	22	14	0	53	0	0	127
POLAR EAGLE	ELPT3	Anchorage	183	176	174	153	187	88	196	199	192	186	0	0	1734
PT BROWER	WDA2796	Anchorage	0	0	0	0	0	0	0	3	26	12	0	0	41
PT. THOMPSON	WBN5092	Anchorage	0	0	0	0	27	0	0	0	0	0	0	0	27
R/V TIGLAX	WZ3423	Anchorage	0	0	0	14	22	14	7	17	0	0	0	0	74
RAINBOW QUEST	VRVZ2	Anchorage	0	0	0	0	0	0	0	1	0	10	0	0	11
REDOUBT	WCG3013	Anchorage	0	0	0	11	9	7	8	2	0	1	0	0	38
SAPPHIRE PRINCESS	ZCDG7	Anchorage	0	0	0	0	0	0	0	0	1	30	0	0	31
SEA PRINCE	WYT8569	Anchorage	0	0	0	0	50	83	68	50	85	63	0	0	399
SEA RANGER	WBM8733	Anchorage	0	0	22	13	19	19	21	8	11	26	0	0	139
SEA VENTURE	WCC7684	Anchorage	0	0	0	0	16	5	14	0	0	0	0	0	35
SEA VICTORY	WCY6777	Anchorage	0	0	0	0	0	0	14	0	0	0	0	0	14
SEA VIKING	WCE8951	Anchorage	0	0	0	0	20	9	0	31	7	21	0	0	88

Ship Name	Call	Port	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
SEABULK MONTANA	WCW9126	Anchorage	90	120	68	19	114	102	84	117	59	69	0	0	842
SENECA	WBN8469	Anchorage	0	0	0	60	83	99	215	452	115	70	0	0	1094
SIKU	WCQ6174	Anchorage	0	0	0	0	0	0	0	0	0	2	0	0	2
SINUK	WCQ8110	Anchorage	0	0	0	93	171	139	146	160	157	106	0	0	972
SIOUX	WBN7617	Anchorage	0	0	0	0	1	60	79	171	92	133	0	0	536
SKY PRINCESS	GYYP	Anchorage	0	0	0	0	0	0	0	0	0	211	0	0	211
ST PAUL RESEARCH	KEY796	Anchorage	0	0	0	0	0	0	0	1	0	0	0	0	1
STAR PRINCESS	ZCDD6	Anchorage	0	0	0	0	0	0	0	0	0	4	0	0	4
SUN PRINCESS	ZCBU6	Anchorage	0	0	0	0	0	0	0	0	0	14	0	0	14
TAHITIAN PRINCESS	ZDDY8	Anchorage	0	0	0	0	0	0	0	0	0	65	0	0	65
TMM TABASCO	VSUA5	Anchorage	0	0	0	0	0	0	0	56	65	85	0	0	206
VOLENDAM	PCHM	Anchorage	0	0	0	0	0	0	0	0	0	4	0	0	4
WESTERN MARINER	WRB9690	Anchorage	1	0	0	0	0	0	1	0	0	1	0	0	3
WESTERN NAVIGATOR	WAX7602	Anchorage	0	0	0	0	14	0	0	0	0	0	0	0	14
WESTERN RANGER	WBN3008	Anchorage	0	0	0	0	39	31	23	0	19	21	0	0	133
ZUIDERDAM	PBIG	Anchorage	0	0	0	0	0	0	0	0	0	1	0	0	1
Anchorage Totals:	# Ships:	64	860	831	941	990	1334	1185	1510	2009	1646	2304	0	0	13610
ALTAIR VOYAGER	C6OK	Baltimore	84	53	36	34	30	32	88	41	55	28	0	0	481
BLUE SKY	ELBX4	Baltimore	0	0	0	0	0	0	0	0	0	7	0	0	7
CHIQUITA BELGIE	C6KD7	Baltimore	53	52	60	52	43	28	41	48	34	37	0	0	448
CHIQUITA DEUTSCHLAND	C6KD8	Baltimore	78	57	76	60	66	62	61	50	47	63	0	0	620
CHIQUITA ITALIA	C6KD5	Baltimore	48	57	50	48	58	45	45	42	51	48	0	0	492
CHIQUITA NEDERLAND	C6KD6	Baltimore	36	52	47	34	51	42	47	41	42	45	0	0	437
CHIQUITA SCANDINAVIA	C6KD4	Baltimore	66	43	55	48	50	50	65	63	33	53	0	0	526
CHIQUITA SCHWEIZ	C6KD9	Baltimore	49	41	44	17	37	38	42	48	49	52	0	0	417
COURTNEY L	ZCAQ8	Baltimore	0	13	7	7	31	30	42	39	49	41	0	0	259
EDYTH L	C6YC	Baltimore	46	40	49	63	57	50	62	64	28	38	0	0	497
FIGARO	S6PI	Baltimore	18	0	27	22	11	21	4	0	0	0	0	0	103
FRANCES L	C6YE	Baltimore	36	34	36	47	37	25	30	33	34	36	0	0	348
GLOBAL SENTINEL	WRZU	Baltimore	0	0	0	0	0	2	9	0	0	24	0	0	35
GREEN COVE	WCZ9380	Baltimore	1	39	14	0	2	0	0	0	0	0	0	0	56
GREEN LAKE	WDDI	Baltimore	11	77	66	75	0	0	0	5	58	31	0	0	323
INDEPENDENCE	WRYG	Baltimore	33	45	0	25	50	60	41	49	32	26	0	0	361
INDEPENDENT VENTURE	A8CG2	Baltimore	0	0	0	0	0	0	1	40	35	31	0	0	107
ITB BALTIMORE	WXKM	Baltimore	8	14	30	5	21	9	1	1	4	13	0	0	106
ITB JACKSONVILLE	WNDG	Baltimore	0	0	0	0	2	0	0	0	0	4	0	0	6
ITB NEW YORK	WVDG	Baltimore	10	6	8	0	0	23	15	0	0	3	0	0	65
LIBERTY	WRYX	Baltimore	28	41	24	55	50	55	55	51	56	64	0	0	479
M/V FREEDOM	WDB5483	Baltimore	34	37	38	39	38	37	42	50	43	50	0	0	408
M/V PATRIOT	WQVY	Baltimore	9	12	50	16	36	39	34	35	36	35	0	0	302
M/V RESOLVE	WCZ5535	Baltimore	39	20	4	0	0	0	8	18	23	16	0	0	128
MAERSK ALASKA	KAKF	Baltimore	20	31	0	0	0	0	0	0	0	0	0	0	51
MAERSK ARIZONA	KAKG	Baltimore	0	0	0	0	0	0	0	0	0	40	0	0	40
MAERSK TAIKI	9VIG	Baltimore	48	30	36	23	42	11	8	36	44	24	0	0	302
MAERSK WIND	S6TY	Baltimore	4	0	0	0	0	0	0	25	83	50	0	0	162
ORION VOYAGER	C6MC5	Baltimore	0	0	0	0	20	80	28	0	0	0	0	0	128
OURO DO BRASIL	ELPP9	Baltimore	0	0	25	40	29	7	27	1	0	0	0	0	129
PITTSBURG	ELTQ6	Baltimore	74	67	67	61	36	55	65	59	64	78	0	0	626
PREMIUM DO BRASIL	A8BL4	Baltimore	26	26	9	7	14	13	7	34	14	8	0	0	158
PRIDE OF BALTIMORE II	WUW2120	Baltimore	0	0	0	0	5	32	32	17	24	2	0	0	112

Ship Name	Call	Port	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
SAUDI ABHA	HZRX	Baltimore	33	3	44	41	23	10	29	37	57	23	0	0	300
SKODSBORG	ZCIJ7	Baltimore	0	17	33	39	20	9	24	27	22	19	0	0	210
SOL DO BRASIL	ELQQ4	Baltimore	5	6	15	36	53	26	29	15	3	6	0	0	194
STAR ALABAMA	LAVU4	Baltimore	35	50	65	37	43	15	49	9	46	15	0	0	364
STAR EAGLE	LAWO2	Baltimore	57	30	11	0	7	32	43	62	10	17	0	0	269
STAR HARMONIA	LAGB5	Baltimore	78	18	24	47	0	28	58	24	6	43	0	0	326
STAR HERDLA	LAVD4	Baltimore	0	49	22	1	16	21	0	24	27	0	0	0	160
STAR HIDRA	LAVN4	Baltimore	0	0	30	9	0	33	32	0	40	20	0	0	164
STAR INDIANA	S6BE	Baltimore	21	8	56	55	55	33	25	18	0	0	0	0	271
STAR ISMENE	LANT5	Baltimore	31	45	56	28	31	27	31	14	39	55	0	0	357
STAR JAPAN	LAZV5	Baltimore	0	0	0	0	0	0	0	0	0	13	0	0	13
TAKASAGO	LACR5	Baltimore	35	32	19	0	0	7	29	0	0	0	0	0	122
TAMPA	LMWO3	Baltimore	0	0	0	0	0	9	18	0	32	18	0	0	77
TREIN MAERSK	MSQQ8	Baltimore	47	22	46	17	18	40	28	0	11	25	0	0	254
TROJAN STAR	C6OD7	Baltimore	21	0	0	13	0	0	0	11	2	1	0	0	48
TYCO DECISIVE	V7DI7	Baltimore	0	0	37	53	0	0	0	0	0	0	0	0	90
TYCO RESPONDER	V7CY9	Baltimore	48	12	0	3	0	0	0	0	3	0	0	0	66
TYCOM RELIANCE	V7CZ2	Baltimore	0	0	0	0	0	0	0	0	22	0	0	0	22
Baltimore Totals:	# Ships:	51	1270	1179	1316	1157	1082	1136	1295	1131	1258	1202	0	0	12026
CAP DOUKATO	A8EW3	Charleston	0	0	0	0	0	0	0	0	0	35	0	0	35
MAERSK CAROLINA	WBDS	Charleston	9	0	23	30	36	56	11	40	19	3	0	0	227
MAERSK MALACCA	9VIN7	Charleston	0	0	0	0	0	8	0	0	0	0	0	0	8
MOL COMMITMENT	9VID2	Charleston	0	0	0	0	0	1	12	6	0	0	0	0	19
SEALAND INTREPID	9VWZ	Charleston	21	16	21	31	30	9	37	1	13	27	0	0	206
SEALAND RACER	MCDW2	Charleston	46	29	4	4	48	0	27	0	45	2	0	0	205
Charleston Totals:	# Ships:	6	76	45	48	65	114	74	87	47	77	67	0	0	700
ARTHUR M. ANDERSON	WE4805	Chicago	49	0	3	42	21	40	55	54	45	24	0	0	333
BARBARA ANDRIE	WTC9407	Chicago	0	0	0	6	6	0	0	0	3	5	0	0	20
BURNS HARBOR	WDB4745	Chicago	4	0	0	11	3	0	0	0	3	21	0	0	42
CASON J. CALLAWAY	WE4879	Chicago	1	0	3	45	36	4	24	19	16	17	0	0	165
CHARLES M. BEEGHLEY	WL3108	Chicago	0	0	0	0	0	0	0	0	13	29	0	0	42
EDGAR B. SPEER	WQZ9670	Chicago	69	0	0	0	41	88	66	10	0	1	0	0	275
G.L. OSTRANDER	WCV7620	Chicago	10	0	0	11	4	0	0	0	0	0	0	0	25
INDIANA HARBOR	WXN3191	Chicago	40	0	0	74	1	66	0	0	1	0	0	0	182
INLAND SEAS	WCJ6214	Chicago	0	0	0	0	1	0	0	0	0	0	0	0	1
JAMES R. BARKER	WYP8657	Chicago	0	0	19	190	77	84	158	100	79	90	0	0	797
JOHN G. MUNSON	WE3806	Chicago	12	0	1	2	0	25	21	3	0	1	0	0	65
JOSEPH L. BLOCK	WDA2768	Chicago	0	0	0	13	3	7	5	1	1	0	0	0	30
KAREN ANDRIE	WBS5272	Chicago	0	0	0	3	0	0	0	0	0	0	0	0	3
KAYE E. BARKER	WCF3012	Chicago	4	0	0	42	22	4	6	38	19	0	0	0	135
KIYI	KAO107	Chicago	0	0	0	0	0	6	3	24	0	6	0	0	39
LEE A. TREGURTHA	WUR8857	Chicago	0	0	0	0	0	0	0	0	20	27	0	0	47
MARK HANNAH	WYZ5243	Chicago	0	0	0	13	22	20	3	15	0	13	0	0	86
MCKEE SONS	WCZ9703	Chicago	0	0	6	64	26	33	22	25	33	61	0	0	270
MESABI MINER	WYQ4356	Chicago	0	0	0	30	36	17	11	7	37	45	0	0	183
MICHIGAN	WRB4141	Chicago	0	0	0	4	4	0	0	0	0	4	0	0	12
OGLEBAY NORTON	WAQ3521	Chicago	0	0	0	0	0	0	0	0	0	1	0	0	1
PAUL R. TREGURTHA	WYR4481	Chicago	0	0	32	89	84	88	69	94	108	121	0	0	685

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PHILIP R. CLARKE	WE3592	Chicago	0	0	0	0	0	2	1	0	0	0	0	0	3
PRESQUE ISLE	WZE4928	Chicago	0	0	0	5	21	69	11	8	7	11	0	0	132
REBECCA LYNN	WCW7977	Chicago	1	0	0	0	0	0	0	0	0	0	0	0	1
ROGER BLOUGH	WZP8164	Chicago	29	0	0	0	1	0	0	0	0	1	0	0	31
SOUTHDOWN CHALLENGER	WA4659	Chicago	4	0	0	14	12	0	0	0	0	0	0	0	30
SS BADGER	WBD4889	Chicago	0	0	0	0	0	0	0	0	12	7	0	0	19
STEWART J. CORT	WDB4570	Chicago	15	0	0	42	16	0	0	0	6	22	0	0	101
SUSAN W. HANNAH	WAH9146	Chicago	0	0	0	0	0	0	0	0	0	6	0	0	6
USCGC MACKINAW	NRKP	Chicago	2	3	0	0	0	0	10	0	0	0	0	0	15
WILFRED SYKES	WDA2769	Chicago	0	0	0	34	20	10	22	31	25	43	0	0	185
Chicago Totals:	# Ships:	32	240	3	64	734	457	563	487	429	428	556	0	0	3961
KILO MOANA	WDA7827	Honolulu	0	8	45	67	64	52	38	76	54	53	0	0	457
NOAA SHIP KA'IMIMOANA	WTEU	Honolulu	12	0	35	19	93	33	95	57	99	24	0	0	467
Honolulu Totals:	# Ships:	2	12	8	80	86	157	85	133	133	153	77	0	0	924
BUFFALO SOLDIER	WWXB	Houston	0	21	13	0	69	0	20	24	2	36	0	0	185
CAJUN EXPRESS	ELXL3	Houston	0	0	0	0	0	0	0	16	14	7	0	0	37
CAPE TRINITY	KAFD	Houston	0	0	0	0	0	0	0	6	0	0	0	0	6
CAPE VINCENT	KAES	Houston	0	42	36	55	1	0	0	0	0	0	0	0	134
CELEBRATION	H3GQ	Houston	19	19	26	0	0	2	5	12	11	11	0	0	105
CHARLESTON	WBVY	Houston	0	0	0	0	0	0	0	0	0	12	0	0	12
CHEMICAL EXPLORER	KRGC	Houston	16	13	10	15	12	0	8	10	17	10	0	0	111
CHEMICAL PIONEER	KAFO	Houston	16	1	21	27	5	0	2	4	0	0	0	0	76
CHEMICAL TRADER	KRGJ	Houston	0	0	0	0	0	0	0	0	0	8	0	0	8
CLEVELAND	KGXA	Houston	85	48	8	45	35	51	54	45	57	34	0	0	462
CYNTHIA FAGAN	KSDF	Houston	47	15	19	0	0	10	9	69	22	39	0	0	230
DEEPWATER HORIZON	H3SM	Houston	50	115	81	28	55	67	63	78	141	53	0	0	731
DEEPWATER MILLENNIUM	3FJA9	Houston	0	0	0	0	0	19	25	29	32	40	0	0	145
DEEPWATER PATHFINDER	HP9216	Houston	0	0	0	0	0	0	70	112	0	0	0	0	182
DISCOVERER SPIRIT	3FTU9	Houston	0	0	0	0	0	4	17	23	6	12	0	0	62
EASTERN EXPRESS	3FDN7	Houston	22	9	0	35	70	30	46	22	0	27	0	0	261
GUS W. DARNELL	KCDK	Houston	24	20	10	16	20	27	23	2	0	0	0	0	142
HUMBER ARM	ZCBQ2	Houston	0	4	10	43	20	0	0	0	0	0	0	0	77
LIBERTY EAGLE	WHIA	Houston	0	0	0	21	13	0	0	0	5	23	0	0	62
LIBERTY WAVE	KRHZ	Houston	0	10	2	7	9	6	7	2	0	24	0	0	67
LINDEN PRIDE	H3VP	Houston	0	0	0	0	0	0	0	0	0	61	0	0	61
LYKES DISCOVERER	WGXO	Houston	138	80	104	76	61	53	75	89	140	94	0	0	910
LYKES EXPLORER	WGLA	Houston	50	98	108	41	45	86	65	45	46	42	0	0	626
LYKES LIBERATOR	WGXN	Houston	77	53	77	111	66	105	109	82	130	113	0	0	923
LYKES MOTIVATOR	WABU	Houston	32	46	41	30	27	27	86	44	39	41	0	0	413
LYKES NAVIGATOR	WGMJ	Houston	103	170	209	71	49	0	65	68	87	83	0	0	905
LYKES RANGER	ZIYE7	Houston	0	26	31	35	30	30	41	56	26	44	0	0	319
MAERSK CONSTELLATION	WRYJ	Houston	7	0	59	4	25	0	0	0	0	0	0	0	95
NOBEL STAR	KRPP	Houston	68	78	55	25	21	15	0	0	0	0	0	0	262
NORWGEIAN SEA	C6DM2	Houston	0	54	88	67	99	74	67	65	67	52	0	0	633
NUEVO LEON	VQHV6	Houston	9	0	0	0	0	0	0	0	0	0	0	0	9
OCEAN CONFIDENCE	V7EA2	Houston	0	0	0	0	0	0	0	13	7	0	0	0	20
OCEAN SARATOGA	V7EB3	Houston	0	0	0	0	0	0	0	7	0	0	0	0	7

Ship Name	Call	Port	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
OCEAN STAR	V7EB6	Houston	0	0	0	0	0	0	0	7	0	0	0	0	7
OCEAN VALIANT	V7EB7	Houston	0	0	0	0	0	0	0	1	2	0	0	0	3
OVERSEAS HARRIETTE	WRFJ	Houston	29	45	44	12	16	23	9	37	39	41	0	0	295
OVERSEAS MARILYN	WFQB	Houston	6	0	0	3	2	0	9	9	3	0	0	0	32
OVERSEAS NEW ORLEANS	WFKW	Houston	27	36	29	31	16	15	2	28	49	31	0	0	264
OVERSEAS PHILADELPHIA	WGDB	Houston	0	0	0	0	17	0	0	0	0	0	0	0	17
PACIFIC EXPLORER	V7DN3	Houston	41	39	38	21	4	1	0	0	0	1	0	0	145
PAUL BUCK	NBBO	Houston	0	0	0	0	0	0	0	0	0	1	0	0	1
PERSEVERANCE	WSKH	Houston	0	0	0	0	0	0	13	12	15	2	0	0	42
RHAPSODY OF THE SEAS	LAZK4	Houston	75	42	30	33	30	61	40	20	25	43	0	0	399
SAUDI DIRIYAH	HZZB	Houston	43	19	29	75	29	30	34	13	0	0	0	0	272
SAUDI HOFUF	HZZC	Houston	57	62	2	67	40	27	39	0	38	50	0	0	382
SAUDI TABUK	HZZD	Houston	37	68	77	56	40	16	11	124	60	35	0	0	524
SCHACKENBORG	ZCIH7	Houston	0	0	27	20	10	38	40	65	24	3	0	0	227
SEALAND ACHIEVER	WPKD	Houston	53	41	46	31	41	40	43	34	41	56	0	0	426
SEALAND ATLANTIC	KRLZ	Houston	77	65	99	63	48	105	54	38	15	18	0	0	582
SEALAND COMMITMENT	KRPB	Houston	90	62	104	52	88	63	56	67	54	34	0	0	670
SEALAND DEVELOPER	KHRH	Houston	67	30	30	105	41	23	53	88	55	45	0	0	537
SEALAND FLORIDA	KRHX	Houston	114	93	55	59	49	46	34	46	41	52	0	0	589
SEALAND INTEGRITY	WPVD	Houston	277	330	177	141	159	181	246	231	231	159	0	0	2132
SEALAND MOTIVATOR	WAAH	Houston	89	80	98	150	90	88	27	0	46	68	0	0	736
SEALAND PERFORMANCE	KRPD	Houston	32	90	78	64	43	19	50	56	58	42	0	0	532
SEALAND PRIDE	WDB9444	Houston	95	47	4	68	61	65	0	70	69	77	0	0	556
SEALAND QUALITY	KRNJ	Houston	57	57	95	62	44	9	48	33	28	28	0	0	461
SKANDERBORG	ZCIG4	Houston	31	0	0	0	16	15	5	14	22	28	0	0	131
STAR FLORIDA	LAVW4	Houston	24	0	25	0	17	0	54	0	25	0	0	0	145
STAR FRASER	LAVY4	Houston	0	44	23	2	41	9	22	33	3	28	0	0	205
STAR ISTIND	LAMP5	Houston	30	28	4	8	7	3	0	0	0	0	0	0	80
TEXAS CLIPPER II	KVWA	Houston	0	0	0	0	0	60	74	8	0	0	0	0	142
TMM CAMPECHE	VSXC9	Houston	2	2	1	0	0	0	1	16	20	10	0	0	52
USNS MARY SEARS(T-AGS 6)	NRFR	Houston	1	0	0	0	0	0	0	0	0	0	0	0	1
Houston Totals:	# Ships:	64	2117	2202	2123	1875	1681	1543	1821	1973	1812	1718	0	0	18865
1ST LT HARRY L. MARTIN	NDFH	Jacksonville	0	18	70	10	27	17	16	25	0	4	0	0	187
CARNIVAL FANTASY	H3GS	Jacksonville	0	4	7	3	8	8	6	0	0	0	0	0	36
CARNIVAL GLORY	3FPS9	Jacksonville	34	22	24	5	12	18	27	21	19	21	0	0	203
DISNEY MAGIC	C6PT7	Jacksonville	0	0	14	18	0	0	0	1	0	0	0	0	33
EL MORRO	KCGH	Jacksonville	0	0	23	4	19	4	18	32	33	16	0	0	149
EL YUNQUE	WGJT	Jacksonville	3	48	67	42	36	45	71	69	30	38	0	0	449
GREEN DALE	WCZ5238	Jacksonville	16	12	12	9	2	12	9	14	24	11	0	0	121
HARMONY ACE	H3QA	Jacksonville	60	54	54	66	51	8	46	16	29	54	0	0	438
HORIZON CHALLENGER	WZJC	Jacksonville	0	39	78	64	67	128	117	76	84	79	0	0	732
HORIZON CRUSADER	WZJF	Jacksonville	0	51	2	47	50	55	11	64	59	66	0	0	405
HORIZON DISCOVERY	WZJD	Jacksonville	0	41	55	55	60	48	48	40	30	34	0	0	411
LTC CALVIN P. TITUS	KJLV	Jacksonville	35	9	0	0	0	0	0	0	0	0	0	0	44
MAERSK TAIYO	9VJO	Jacksonville	0	0	0	0	0	34	7	0	0	8	0	0	49
MARINER OF THE SEAS	C6FV9	Jacksonville	0	0	0	0	0	0	0	0	18	1	0	0	19
NOAA SHIP OSCAR ELTON SETTE	WTEE	Jacksonville	53	5	41	40	39	48	43	62	18	22	0	0	371
OVERSEAS JOYCE	WUQL	Jacksonville	19	20	4	20	14	8	1	13	23	27	0	0	149
SOLAR WING	ELJS7	Jacksonville	94	92	98	100	103	92	100	105	96	107	0	0	987

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STAR AMERICA	LAVV4	Jacksonville	43	38	21	27	41	16	1	57	22	18	0	0	284
STAR EVVIVA	LAHE2	Jacksonville	61	49	0	29	8	3	0	0	43	28	0	0	221
STAR HANSA	LAXP4	Jacksonville	12	0	6	19	0	0	2	9	0	1	0	0	49
TALISMAN	LAOW5	Jacksonville	21	17	0	0	15	7	0	22	13	0	0	0	95
Jacksonville Totals:	# Ships:	21	451	519	576	558	552	551	523	626	541	535	0	0	5432
ALASKA SPIRIT	WCC5414	Kodiak	0	0	0	0	0	0	0	0	0	3	0	0	3
ALASKAN LEADER	WDB7918	Kodiak	0	0	0	0	0	0	0	31	39	87	0	0	157
ALPHA HELIX	WSD7078	Kodiak	0	0	5	0	35	3	21	0	3	0	0	0	67
ATLANTIS	KAQP	Kodiak	0	0	0	7	5	8	8	0	0	0	0	0	28
AURORA	WYM9567	Kodiak	17	12	0	0	0	4	24	30	16	0	0	0	103
BIG VALLEY	WCX5558	Kodiak	0	0	0	0	0	0	0	0	0	14	0	0	14
BLARNEY	WBP4766	Kodiak	0	5	0	17	3	0	0	0	0	0	0	0	25
BLUEFIN	WQZ9646	Kodiak	0	0	0	0	0	0	0	1	0	0	0	0	1
BOUCHARD BOYS	WCY7761	Kodiak	12	12	0	0	0	0	0	0	0	1	0	0	25
BOWFIN	WSX7318	Kodiak	0	1	1	0	0	1	0	0	0	0	0	0	3
BUCCANEER	WYW5588	Kodiak	0	0	0	0	0	0	0	1	7	21	0	0	29
CAMAI	WCY2272	Kodiak	0	0	0	0	0	0	0	0	17	11	0	0	28
CAPT LES EASOM	WTT8587	Kodiak	2	0	0	0	3	0	6	1	0	0	0	0	12
CHINOOK	WCY2791	Kodiak	7	0	0	0	0	0	0	0	0	0	0	0	7
COASTAL EXPLORER	WCY3172	Kodiak	0	0	0	1	1	8	5	0	0	0	0	0	15
COASTAL PILOT	WBP7281	Kodiak	3	0	1	0	0	0	0	0	3	4	0	0	11
COASTAL RELIANCE	WADZ	Kodiak	17	8	13	40	43	13	66	31	55	61	0	0	347
COASTAL TRADER	WSL8560	Kodiak	0	0	1	1	0	0	0	1	0	0	0	0	3
COIN OF THE REALM	KL0YL	Kodiak	0	0	0	0	0	0	0	0	0	1	0	0	1
CORBIN FOSS	WDB5265	Kodiak	0	9	0	1	0	0	0	0	0	0	0	0	10
CORWITH CRAMER	WTF3319	Kodiak	0	0	0	0	0	0	0	0	0	27	0	0	27
DIANE H.	WUR7250	Kodiak	0	0	0	3	0	0	0	0	0	83	0	0	86
DREW FOSS	WYL7518	Kodiak	0	0	6	22	0	0	6	3	0	13	0	0	50
EMMA FOSS	WCF3931	Kodiak	0	0	0	0	0	0	3	4	22	0	0	0	29
FISHHAWK	WRB5085	Kodiak	0	0	0	0	21	8	5	0	18	0	0	0	52
GLADIATOR	WCZ9000	Kodiak	0	0	0	0	0	3	12	0	0	0	0	0	15
GRETA	WCY2853	Kodiak	0	0	0	0	24	6	0	0	0	78	0	0	108
GYR FALCON	WCU6587	Kodiak	0	0	1	2	0	0	0	1	1	0	0	0	5
HALLE FOSS	WCF3930	Kodiak	0	0	0	0	0	0	3	0	0	0	0	0	3
HENRY SAUSE	WTW9259	Kodiak	1	0	0	0	0	0	0	0	0	0	0	0	1
HMI BRENTON REEF	WCY8453	Kodiak	63	37	53	36	49	0	0	0	0	25	0	0	263
IVER FOSS	WYE6442	Kodiak	0	0	0	1	0	6	0	0	0	13	0	0	20
JEFFREY FOSS	WCX4608	Kodiak	0	0	0	0	0	10	0	0	0	26	0	0	36
JOHN BRIX	WCY7560	Kodiak	7	19	12	0	0	0	11	11	51	24	0	0	135
JOSEPH SAUSE	WTW9258	Kodiak	1	0	0	0	0	0	0	0	0	0	0	0	1
JUSTINE FOSS	WYL4978	Kodiak	8	6	1	0	5	8	0	5	15	12	0	0	60
KATHERINE	WUS5485	Kodiak	0	0	0	0	0	0	0	0	6	0	0	0	6
KENAI	WSNB	Kodiak	49	105	20	4	5	11	7	17	18	3	0	0	239
KENNICOTT	WCY2920	Kodiak	0	0	47	32	69	52	75	55	83	14	0	0	427
LAUREN FOSS	WDB3834	Kodiak	0	0	0	0	0	0	43	58	37	0	0	0	138
LAZY BAY	WDB8266	Kodiak	0	0	0	0	0	0	0	0	0	7	0	0	7
LNG GEMINI	V7BW9	Kodiak	31	29	27	19	25	15	25	40	43	24	0	0	278
LOIS H.	WTD4576	Kodiak	0	0	0	0	2	1	0	0	0	0	0	0	3
MAIA H.	WYX2079	Kodiak	0	0	0	0	0	0	0	0	2	1	0	0	3
MALOLO	WYH6327	Kodiak	6	8	0	0	0	0	0	0	0	0	0	0	14

Ship Name	Call	Port	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
MANFRED NYSTROM	WCN3590	Kodiak	0	20	12	19	10	4	7	0	0	0	0	0	72
MARCY J	WCF4791	Kodiak	0	0	0	0	0	0	0	0	0	19	0	0	19
MAUNA LOA	WCY8398	Kodiak	3	0	0	0	0	0	0	0	0	0	0	0	3
MIKI HANA	WTW9252	Kodiak	5	0	0	0	0	6	0	0	0	0	0	0	11
MIKI MIKI	WTW9266	Kodiak	0	1	4	0	0	0	0	0	0	0	0	0	5
MI-OI	WTT3606	Kodiak	0	0	0	0	0	0	0	0	0	1	0	0	1
NATOMA	WBB5799	Kodiak	6	0	0	0	0	0	0	0	5	4	0	0	15
NAVAJO	WCT5737	Kodiak	2	15	3	4	7	6	7	3	0	0	0	0	47
NORCOASTER	WYP7276	Kodiak	0	0	0	0	4	0	1	1	0	0	0	0	6
NORMA H.	WYL6686	Kodiak	0	0	0	0	16	0	0	0	0	0	0	0	16
NORTHERN SPIRIT	WAQ2746	Kodiak	27	75	0	0	0	0	0	0	0	0	0	0	102
NORTHERN VICTOR	WCZ6534	Kodiak	12	0	0	4	0	4	0	0	0	11	0	0	31
OCEAN RELIANCE	WADY	Kodiak	1	4	8	15	8	29	3	1	6	8	0	0	83
OCEAN SERVICE	WTW9263	Kodiak	6	1	0	0	4	0	0	0	0	0	0	0	11
OCEAN VICTORY	V7EB8	Kodiak	0	0	0	0	0	59	100	69	27	12	0	0	267
OVERSEAS CHICAGO	KBCF	Kodiak	38	27	4	0	0	0	8	4	0	1	0	0	82
OVERSEAS NEW YORK	WMCK	Kodiak	48	30	45	0	0	5	9	25	23	28	0	0	213
PACIFIC AVENGER	WCY8175	Kodiak	0	1	2	0	1	0	0	1	0	0	0	0	5
PACIFIC CHALLENGER	WDA3588	Kodiak	81	22	67	153	147	141	230	335	220	283	0	0	1679
PACIFIC FREEDOM	WDJF	Kodiak	0	2	8	0	0	10	61	12	0	0	0	0	93
PACIFIC PATRIOT	WDB6493	Kodiak	0	0	3	3	14	13	59	77	0	78	0	0	247
PACIFIC PRIDE	WCN4995	Kodiak	0	3	38	34	0	8	0	0	0	0	0	0	83
PACIFIC RAVEN	WYZ3112	Kodiak	0	4	16	7	13	16	16	7	8	28	0	0	115
PARAGON	WDA2311	Kodiak	79	56	43	51	54	58	79	116	42	1	0	0	579
PATRIOT	NL9WX	Kodiak	0	0	0	0	0	0	79	47	17	28	0	0	171
PHYLLIS DUNLAP	WDA6552	Kodiak	0	0	0	0	0	0	1	30	129	2	0	0	162
RESOLUTION	WBR6941	Kodiak	0	0	0	0	0	0	0	0	0	1	0	0	1
ROBERT C. SEAMENS	WDA4486	Kodiak	0	0	0	0	0	0	0	0	0	30	0	0	30
ROBERT L.	WTW9264	Kodiak	0	1	1	0	0	0	0	0	0	0	0	0	2
ROUGHNECK	WTW9262	Kodiak	3	13	9	4	5	6	7	8	0	0	0	0	55
SALISHAN	WUT4384	Kodiak	5	2	0	0	0	0	0	0	0	0	0	0	7
SAM M. TAALAK	WCX5321	Kodiak	0	0	0	0	0	0	0	0	0	18	0	0	18
SAMSON MARINER	WCN3586	Kodiak	6	2	6	6	14	2	10	5	6	14	0	0	71
SANDRA FOSS	WYL4908	Kodiak	0	0	0	0	11	10	0	0	1	19	0	0	41
SEA RELIANCE	WEOB	Kodiak	18	17	14	1	0	0	0	0	0	1	0	0	51
SEA STORM	WCV9132	Kodiak	0	0	0	0	0	5	12	0	0	0	0	0	17
SEABULK ARCTIC	WCY7054	Kodiak	24	26	24	15	6	10	18	48	53	12	0	0	236
SEABULK PRIDE	WCY7052	Kodiak	35	38	21	8	24	17	52	26	9	23	0	0	253
SIDNEY FOSS	WYL5445	Kodiak	0	0	0	19	32	12	4	7	5	0	0	0	79
SNOHOMISH	WSQ8098	Kodiak	0	0	2	0	0	0	0	0	0	0	0	0	2
SOUND RELIANCE	WXAE	Kodiak	24	12	16	13	9	6	1	0	0	4	0	0	85
SPIRIT	3TFU9	Kodiak	0	0	0	0	0	9	23	13	17	1	0	0	63
STACEY FOSS	WYL4909	Kodiak	0	0	0	0	0	14	0	0	0	16	0	0	30
STIMSON	WCY2270	Kodiak	26	6	5	77	4	4	10	0	16	27	0	0	175
TAKU	WI9491	Kodiak	13	9	9	11	26	12	0	8	2	0	0	0	90
TENACIOUS	WTK2123	Kodiak	0	0	0	0	0	1	0	0	0	0	0	0	1
TITAN	WAW9232	Kodiak	7	5	7	4	9	2	8	2	0	8	0	0	52
TONSINA	KJDG	Kodiak	11	30	9	11	14	1	6	6	19	12	0	0	119
TRIDENT	WCZ2913	Kodiak	1	0	1	6	0	0	1	1	0	7	0	0	17
TUSTUMENA	WNGW	Kodiak	106	25	0	19	63	24	41	110	182	59	0	0	629
USCGC ACUSHNET WMEC 167	NNHA	Kodiak	0	0	0	0	0	0	0	0	0	14	0	0	14

VOS Cooperative Ship Report

Ship Name	Call	Port	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
USCGC ALEX HALEY	NZPO	Kodiak	0	5	4	0	0	0	0	0	0	0	0	0	9
USCGC EAGLE	NRCB	Kodiak	1	0	0	0	0	0	0	0	0	0	0	0	1
USCGC MAPLE (WLB 207)	NWBE	Kodiak	0	0	0	0	0	0	0	1	0	0	0	0	1
USCGC SPAR	NJAR	Kodiak	0	0	0	0	0	1	0	0	0	0	0	0	1
USCGC STORIS	NRUC	Kodiak	7	0	0	0	0	25	0	0	0	0	0	0	32
VIKING STAR	WAS4138	Kodiak	10	5	3	3	2	0	0	0	6	7	0	0	36
WOLDSTAD	WCY2271	Kodiak	19	30	31	7	11	28	41	5	0	42	0	0	214
ZENITH	WBV3237	Kodiak	0	1	2	2	2	0	0	1	0	3	0	0	11
Kodiak Totals:	# Ships:	104	848	739	605	682	800	705	1214	1259	1229	1375	0	0	9456
APL AMAZONITE	9VBX	Long Beach	0	0	0	0	9	13	20	10	18	11	0	0	81
APL CHINA	WDB3161	Long Beach	40	41	58	48	54	54	52	73	41	65	0	0	526
APL KOREA	WCX8883	Long Beach	15	15	19	22	35	24	27	9	28	43	0	0	237
APL PHILIPPINES	WCX8884	Long Beach	50	25	11	17	42	23	31	8	13	16	0	0	236
APL SINGAPORE	WCX8812	Long Beach	49	47	53	65	45	60	42	49	39	55	0	0	504
APL THAILAND	WCX8882	Long Beach	58	37	25	38	16	24	28	35	54	33	0	0	348
CALIFORNIA JUPITER	ELKU8	Long Beach	0	5	0	0	0	0	0	0	0	0	0	0	5
CENTURY HIGHWAY #2	3EJB9	Long Beach	0	0	0	0	0	0	0	17	18	15	0	0	50
DENALI	WSVR	Long Beach	16	13	16	13	18	20	0	0	0	0	0	0	96
DIRCH MAERSK	OXQP2	Long Beach	6	53	0	63	0	62	0	47	0	24	0	0	255
EVER RIGHT	3FML3	Long Beach	0	0	0	0	0	0	3	4	6	5	0	0	18
EVER ROUND	3FQN3	Long Beach	0	0	0	0	0	0	11	6	3	11	0	0	31
EVER ROYAL	3FGI3	Long Beach	0	6	0	15	0	0	0	0	0	0	0	0	21
EWA	WEZM	Long Beach	61	56	35	51	29	23	32	54	35	38	0	0	414
HANSA INDIA	ELYD5	Long Beach	68	42	56	36	21	32	17	25	16	1	0	0	314
HORIZON CONSUMER	WCHF	Long Beach	21	39	52	31	29	40	40	22	20	29	0	0	323
HORIZON NAVIGATOR	WPGK	Long Beach	29	61	61	43	48	35	39	46	39	22	0	0	423
HORIZON PACIFIC	WSRL	Long Beach	69	60	55	72	58	52	77	80	77	64	0	0	664
HORIZON RELIANCE	WFLH	Long Beach	78	69	71	79	80	62	81	85	94	80	0	0	779
KAUAI	WSRH	Long Beach	63	62	37	31	48	47	26	33	53	43	0	0	443
MAREN MAERSK	OWZU2	Long Beach	38	13	31	11	44	4	60	15	45	7	0	0	268
MARGRETHE MAERSK	OYSN2	Long Beach	31	9	13	6	14	34	23	31	19	43	0	0	223
MATHILDE MAERSK	OUUU2	Long Beach	16	32	22	29	25	35	29	39	29	51	0	0	307
MAUI	WSLH	Long Beach	53	62	43	51	34	40	55	43	51	44	0	0	476
MELVILLE	WECB	Long Beach	46	51	48	28	26	39	81	62	75	85	0	0	541
METTE MAERSK	OXKT2	Long Beach	23	25	21	37	21	25	22	49	16	34	0	0	273
NEW HORIZON	WKWB	Long Beach	0	14	12	4	2	11	45	47	11	13	0	0	159
NOAA DAVID STARR JORDAN	WTDK	Long Beach	5	0	0	0	41	46	43	6	100	166	0	0	407
OOCL FAIR	VRWB8	Long Beach	38	27	0	5	0	4	11	9	16	7	0	0	117
OOCL FIDELITY	VRWG5	Long Beach	1	0	2	1	0	3	0	27	18	24	0	0	76
OOCL NETHERLANDS	VRVN6	Long Beach	4	0	0	0	0	3	8	0	4	0	0	0	19
POLAR CALIFORNIA	WMCV	Long Beach	9	15	60	33	11	3	10	36	27	29	0	0	233
PRESIDENT GRANT	WCY2098	Long Beach	56	61	54	39	43	22	23	67	51	45	0	0	461
PRESIDENT WILSON	WCY3438	Long Beach	26	44	46	31	44	45	42	47	54	30	0	0	409
R.J. PFEIFFER	WRJP	Long Beach	31	32	17	18	29	26	26	18	15	12	0	0	224
SEALAND EAGLE	MCDZ9	Long Beach	20	23	11	20	3	14	3	12	21	34	0	0	161
SEALAND EXPRESS	KGJD	Long Beach	15	61	297	334	498	361	301	317	431	585	0	0	3200
SEALAND INDEPENDENCE	WGJC	Long Beach	0	0	0	0	0	0	0	0	3	56	0	0	59
SEALAND VOYAGER	KHRK	Long Beach	69	72	60	26	9	6	40	82	81	55	0	0	500
SEARIVER COLUMBIA BAY	WFQE	Long Beach	0	0	0	0	0	0	0	0	0	5	0	0	5

Ship Name	Call	Port	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
STAR GRAN	LADR4	Long Beach	0	0	0	0	0	0	30	0	0	0	0	0	30
TAUSALA SAMOA	V2FA2	Long Beach	17	57	64	86	67	92	62	60	35	37	0	0	577
Long Beach Totals:	# Ships:	42	1121	1229	1350	1383	1443	1384	1440	1570	1656	1917	0	0	14493
ALBEMARLE ISLAND	C6LU3	Miami	53	43	41	18	32	18	30	32	19	37	0	0	323
ANASTASIS	9HOZ	Miami	0	0	5	0	0	2	3	0	1	13	0	0	24
ARIZONA VOYAGER	KGBE	Miami	0	0	0	0	21	16	1	11	40	27	0	0	116
BARRINGTON ISLAND	C6QK	Miami	46	40	60	64	62	43	49	63	60	63	0	0	550
BERING SEA	C6YY	Miami	0	0	13	22	21	3	0	0	7	0	0	0	66
CARIBBEAN MERCY	3FFU4	Miami	2	0	0	1	0	0	0	0	15	0	0	0	18
CARNIVAL DESTINY	C6FN4	Miami	0	0	0	0	0	0	0	0	4	13	0	0	17
CARNIVAL LEGEND	H3VT	Miami	0	0	0	0	11	1	0	0	0	0	0	0	12
CARNIVAL PARADISE	3FOB5	Miami	19	14	12	1	8	13	9	7	7	0	0	0	90
CARNIVAL PRIDE	H3VU	Miami	0	3	8	2	3	0	7	11	6	2	0	0	42
CARNIVAL TRIUMPH	C6FN5	Miami	0	0	0	2	12	11	14	20	6	12	0	0	77
CARNIVAL VICTORY	3FFL8	Miami	9	12	8	0	25	28	25	27	18	9	0	0	161
CELTIC SEA	C6RT	Miami	81	57	64	19	0	0	0	0	29	30	0	0	280
CHARLES ISLAND	C6JT	Miami	25	0	0	1	40	40	42	51	53	27	0	0	279
CHELSEA	KNCX	Miami	0	0	0	0	0	0	0	0	0	2	0	0	2
CHIQUITA BREMEN	ZCBC5	Miami	0	30	44	29	36	33	34	38	38	22	0	0	304
CORAL SEA	C6YW	Miami	0	0	26	11	14	11	10	24	15	19	0	0	130
DUNCAN ISLAND	C6JS	Miami	55	44	25	27	32	21	26	41	44	59	0	0	374
ELATION	3FOC5	Miami	0	0	2	24	42	35	17	10	17	64	0	0	211
EXPLORER OF THE SEAS	ELWX5	Miami	66	363	472	429	458	404	418	141	284	0	0	0	3035
FASCINATION	C6FM9	Miami	0	12	4	0	0	0	5	0	0	0	0	0	21
GALAXY	C6FU6	Miami	3	3	6	11	8	0	0	0	0	0	0	0	31
HOOD ISLAND	C6LU4	Miami	44	46	19	27	54	58	47	43	37	32	0	0	407
JOHANNES MAERSK	OWFD2	Miami	37	44	48	19	14	20	18	21	22	12	0	0	255
MAASDAM	PFRO	Miami	4	58	69	52	4	9	3	0	0	5	0	0	204
MARIT MAERSK	OZFC2	Miami	0	0	3	0	0	0	0	0	0	0	0	0	3
MEKONG PIONEER	V2JN	Miami	79	6	19	57	16	0	0	0	0	44	0	0	221
NAVIGATOR OF THE SEAS	C6FU4	Miami	38	32	23	13	11	2	2	0	16	10	0	0	147
NOVA TERRA	C6IZ7	Miami	0	0	9	12	25	44	57	48	38	44	0	0	277
OLIVIA MAERSK	OXKO2	Miami	32	15	17	61	32	23	9	33	83	9	0	0	314
ORIANA	GVSN	Miami	0	0	0	0	0	0	0	0	0	4	0	0	4
RYNDAM	PHFV	Miami	0	0	12	1	0	0	0	0	0	0	0	0	13
SEA NOVIA	ELRV2	Miami	0	0	0	0	0	0	0	0	0	9	0	0	9
SEALAND METEOR	MCDW3	Miami	0	0	9	31	22	21	24	22	47	33	0	0	209
SENSATION	C6FM8	Miami	0	0	0	0	0	0	0	0	0	4	0	0	4
STATENDAM	PHSG	Miami	16	13	9	14	4	4	15	9	7	11	0	0	102
VOYAGER OF THE SEAS	C6SE5	Miami	0	0	1	4	0	0	0	0	0	0	0	0	5
ZAANDAM	PDAN	Miami	0	0	0	0	0	0	0	0	0	10	0	0	10
ZIM KOREA	4XGU	Miami	0	0	0	23	13	0	37	6	1	24	0	0	104
ZIM PANAMA	VSWW5	Miami	0	0	0	0	0	0	0	31	18	16	0	0	65
Miami Totals:	# Ships:	40	609	835	1028	975	1020	860	902	689	932	666	0	0	8516
ARA J	V2JH	New Orleans	0	0	0	14	72	45	41	9	0	0	0	0	181
ATLANTIC FOREST	WDB2122	New Orleans	37	26	2	0	3	5	25	20	1	22	0	0	141
BBC DENMARK	PJGA	New Orleans	0	0	0	0	0	0	0	17	0	0	0	0	17
BERNARDO QUINTANA A	C6KJ5	New Orleans	82	73	69	45	49	55	71	79	78	78	0	0	679

Ship Name	Call	Port	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
CAPT STEVEN L BENNETT	KAXO	New Orleans	8	0	10	5	3	0	2	3	3	5	0	0	39
CARNIVAL CONQUEST	3FPQ9	New Orleans	12	8	12	10	15	8	8	8	9	0	0	0	90
DISCOVERER DEEP SEAS	HP9685	New Orleans	53	42	35	46	47	51	41	65	53	50	0	0	483
DISCOVERER ENTERPRISE	3FZQ7	New Orleans	9	15	20	23	17	23	24	16	0	2	0	0	149
HOLIDAY	C6FM6	New Orleans	0	0	0	0	18	12	15	17	16	6	0	0	84
JAG PRACHI	ATPN	New Orleans	0	0	0	0	0	0	0	25	43	0	0	0	68
JUDY LITRICO	KCKB	New Orleans	2	26	46	45	38	4	0	42	22	36	0	0	261
LIBERTY GLORY	WADP	New Orleans	0	0	20	8	0	0	0	45	40	21	0	0	134
LIBERTY GRACE	WADN	New Orleans	0	0	16	0	0	0	0	0	29	29	0	0	74
LIBERTY SEA	KPZH	New Orleans	0	0	0	0	0	0	1	50	55	30	0	0	136
LIBERTY SPIRIT	WCPU	New Orleans	31	16	25	38	44	46	24	21	24	7	0	0	276
LIBERTY STAR	WCBP	New Orleans	0	0	1	111	40	15	64	59	25	10	0	0	325
LIBERTY SUN	WCOB	New Orleans	56	23	0	33	11	0	17	0	21	24	0	0	185
M/V ASPHALT COMMANDER	WFJN	New Orleans	0	0	0	0	0	0	29	11	0	0	0	0	40
M/V GSF EXPLORER	WCX5333	New Orleans	0	0	0	0	0	0	21	87	77	60	0	0	245
MECTA SEA	C6PJ3	New Orleans	0	0	0	0	0	0	0	0	5	11	0	0	16
MT VIRGO VOYAGER	C6FG8	New Orleans	7	4	11	21	13	0	0	39	24	23	0	0	142
MV MONTAUK	WDCJ	New Orleans	12	26	51	47	28	0	1	0	16	12	0	0	193
NOAA SHIP GORDON GUNTER	WTEO	New Orleans	63	70	43	117	151	115	189	101	142	102	0	0	1093
NOAA SHIP OREGON II	WTDO	New Orleans	0	0	0	0	95	52	102	72	67	49	0	0	437
NOAA SHIP RONALD H BROWN	WTEC	New Orleans	0	22	65	39	108	76	78	66	30	57	0	0	541
POLAR ADVENTURE	WAZV	New Orleans	0	0	0	0	0	0	0	0	0	2	0	0	2
POLAR DISCOVERY	WACW	New Orleans	10	14	10	8	14	17	23	18	11	9	0	0	134
POLAR ENDEAVOUR	WCAJ	New Orleans	26	18	34	8	0	9	20	7	25	12	0	0	159
POLAR RESOLUTION	WDJK	New Orleans	55	57	51	24	27	58	59	51	40	44	0	0	466
RHINE FOREST	V7EI9	New Orleans	0	0	0	0	0	0	0	0	0	21	0	0	21
RICKMERS HAMBERG	V7DS3	New Orleans	0	0	0	0	0	0	0	0	0	18	0	0	18
ROGER REVELLE	KAOU	New Orleans	97	39	70	10	35	43	48	50	49	56	0	0	497
SHEILA MCDEVITT	WDA4069	New Orleans	23	22	12	3	2	3	5	9	68	2	0	0	149
WILSON	WNPD	New Orleans	36	16	27	20	28	33	31	8	24	6	0	0	229
ZIM ITALIA	4XGT	New Orleans	0	47	0	4	65	0	0	53	0	19	0	0	188
New Orleans Totals:	# Ships:	35	619	564	630	679	923	670	939	1048	997	823	0	0	7892
ARCTIC OCEAN	C6T2062	New York City	0	0	0	0	23	29	51	37	1	14	0	0	155
ARGONAUT	KFDV	New York City	37	17	0	0	19	15	38	9	2	1	0	0	138
ATLANTIC OCEAN	C6T2064	New York City	20	23	36	26	25	21	16	0	28	26	0	0	221
BARENTS SEA	9VAP5	New York City	0	0	29	49	51	45	70	82	40	62	0	0	428
CELINE	HBEF	New York City	0	0	0	0	0	0	0	3	8	16	0	0	27
CMA CGM KINGSTON	A8CS3	New York City	0	0	0	0	3	59	58	52	46	0	0	0	218
DELAWARE BRIDGE	V2OE2	New York City	0	0	0	0	0	0	0	0	51	85	0	0	136
EMPIRE STATE	KKFW	New York City	0	0	0	0	24	27	22	0	0	0	0	0	73
ENDEAVOR	WAUW	New York City	40	54	38	29	41	31	26	27	47	0	0	0	333
ENDURANCE	WAUU	New York City	5	46	56	18	14	35	59	23	17	22	0	0	295
ENTERPRISE	WAUY	New York City	64	35	25	96	62	57	35	35	50	64	0	0	523
EURO SPIRIT	ELUW8	New York City	0	0	0	9	12	15	14	5	0	0	0	0	55
EVER DECENT	3FUO7	New York City	0	0	0	0	12	2	0	15	0	0	0	0	29
EVER DIADEM	3FOF8	New York City	1	0	0	0	0	0	0	14	12	9	0	0	36
EVER REACH	3FQO4	New York City	0	10	10	21	13	19	14	14	11	25	0	0	137

Ship Name	Call	Port	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
GREEN POINT	WCY4148	New York City	34	27	29	30	37	7	32	29	12	12	0	0	249
HANJIN SHANGHAI	3FGI5	New York City	0	0	0	0	0	0	5	36	26	19	0	0	86
HANSA CENTURY	ELUP5	New York City	0	0	0	0	0	0	0	0	0	20	0	0	20
HORIZON HAWAII	KIRF	New York City	72	47	72	75	67	50	70	67	82	79	0	0	681
HORIZON PRODUCER	WJBJ	New York City	17	84	75	70	71	61	62	68	66	55	0	0	629
HYUNDAI GRACE	9VVD	New York City	0	0	23	14	0	2	5	1	6	0	0	0	51
INDIAN OCEAN	C6T2063	New York City	28	27	16	48	55	16	14	33	25	1	0	0	263
ITB GROTON	KMJL	New York City	39	38	27	20	12	71	57	23	30	52	0	0	369
JENS MAERSK	OYYK2	New York City	38	37	42	44	34	37	44	32	52	6	0	0	366
JEPPESEN MAERSK	OWTW2	New York City	0	0	0	0	10	26	23	10	41	26	0	0	136
KOTA PERTAMA	DGVS	New York City	0	0	0	0	18	15	33	49	32	31	0	0	178
LNG ARIES	V7BW7	New York City	0	0	0	0	0	0	0	0	19	6	0	0	25
LNG CAPRICORN	V7BW8	New York City	0	0	0	0	0	0	0	75	49	62	0	0	186
LNG LEO	V7BX2	New York City	0	9	64	73	26	13	52	73	86	61	0	0	457
LNG LIBRA	V7BX3	New York City	0	0	0	0	0	0	0	1	1	0	0	0	2
LNG TAURUS	V7BX4	New York City	0	15	67	62	62	58	62	14	15	10	0	0	365
LNG VIRGO	V7BX5	New York City	0	0	0	0	60	77	75	66	0	47	0	0	325
MABEL RICKMERS	V7EO5	New York City	0	0	0	0	0	0	0	0	18	0	0	0	18
MACKINAC BRIDGE	JKES	New York City	55	47	44	44	53	52	42	50	47	52	0	0	486
MAERSK DUBLIN	V2OE1	New York City	0	0	0	0	0	0	0	11	19	5	0	0	35
MAERSK GEORGIA	WAHP	New York City	0	0	0	0	12	17	13	18	17	19	0	0	96
MAERSK NANTES	V2OO7	New York City	0	0	0	0	0	9	20	47	37	52	0	0	165
MAERSK NEWARK	A8CF2	New York City	0	1	43	25	35	22	23	45	37	36	0	0	267
MAERSK VALENCIA	DAPG	New York City	0	0	0	0	0	0	0	0	0	5	0	0	5
MAGLEBY MAERSK	OUSH2	New York City	14	41	10	51	25	24	27	51	34	48	0	0	325
MAJESTIC MAERSK	OUJH2	New York City	40	26	42	32	43	27	30	8	10	13	0	0	271
MANUKAI	WRGD	New York City	47	30	41	43	34	28	33	22	13	12	0	0	303
MARIE MAERSK	OULL2	New York City	0	39	6	29	20	32	34	25	34	26	0	0	245
MARIELLE BOLTEN	ELZH9	New York City	0	0	0	0	41	37	34	32	36	13	0	0	193
MARTORELL	HPNE	New York City	0	0	0	0	40	52	47	92	62	88	0	0	381
MAUNAWILI	WDB7104	New York City	0	0	0	0	0	0	0	4	18	13	0	0	35
MAURICE EWING	WLDZ	New York City	0	11	0	17	71	29	30	19	2	34	0	0	213
MC-KINNEY MAERSK	OUZW2	New York City	34	7	7	10	15	12	5	9	16	11	0	0	126
MSC FEDERICA	C4LV	New York City	0	0	0	0	7	6	31	18	4	3	0	0	69
MSC INSA	3FWO5	New York City	0	0	0	0	0	22	4	10	2	7	0	0	45
MSC JESSICA	H3YF	New York City	0	0	0	0	2	27	17	19	20	4	0	0	89
MSC MATILDE	HODP	New York City	0	0	0	0	0	0	0	0	0	52	0	0	52
MSC NURIA	3FIE6	New York City	0	0	0	0	0	0	8	10	7	0	0	0	25
NOAA SHIP DELAWARE II	KNBD	New York City	28	93	68	156	92	45	127	147	73	88	0	0	917
NORDFALCON	P3KC8	New York City	0	0	0	0	0	0	0	3	50	55	0	0	108
OLEANDER	PJJU	New York City	0	1	10	15	3	0	8	0	1	8	0	0	46
OLUF MAERSK	OXFU2	New York City	33	6	30	12	14	20	13	17	36	11	0	0	192
OOCL FAITH	VRWG6	New York City	0	0	0	0	0	25	26	52	57	58	0	0	218
OTELLO	SCFH	New York City	0	0	0	0	0	0	0	29	79	35	0	0	143
PINE ARROW	C6NZ3	New York City	0	0	0	0	0	61	34	20	69	88	0	0	272
SAFMARINE GONUBIE	DGVB	New York City	0	0	0	0	0	1	0	0	0	0	0	0	1
SAFMARINE ZAMBEZI	A8CE9	New York City	0	0	0	0	0	18	43	26	24	49	0	0	160
T/V ENTERPRISE	KVMU	New York City	15	74	0	0	0	0	0	0	0	0	0	0	89
T/V STATE OF MAINE	WCAH	New York City	0	0	0	0	15	74	0	0	0	0	0	0	89

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Ship Name	Call	Port	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
YM GENOVA II	ELVX2	New York City	0	0	0	0	0	0	0	27	71	76	0	0	174
ZIM AMERICA	4XGR	New York City	36	0	44	15	0	27	20	0	9	54	0	0	205
New York City Totals:	# Ships:	66	697	845	954	1133	1273	1455	1606	1704	1757	1826	0	0	13250
2ND LT JOHN P. BOBO	WJKH	Norfolk	0	0	0	21	32	1	5	4	31	34	0	0	128
ADVANTAGE	WPPO	Norfolk	0	0	0	0	34	65	0	10	10	0	0	0	119
ALKIN KALKAVAN	TCQP	Norfolk	0	0	0	6	34	38	21	9	17	8	0	0	133
APL ALMANDINE	9VBS	Norfolk	0	0	0	0	0	10	17	11	16	8	0	0	62
APL DALIAN	S6HU6	Norfolk	0	0	0	0	0	0	0	0	0	43	0	0	43
BESIRE KALKAVAN	TCAO	Norfolk	0	0	0	18	0	0	30	27	26	20	0	0	121
CAP SAN ANTONIO	ELZU6	Norfolk	15	13	7	12	22	21	32	22	16	13	0	0	173
CHESAPEAKE BAY	WMLH	Norfolk	42	70	44	24	31	51	22	21	33	39	0	0	377
COLUMBUS CANADA	P3RD8	Norfolk	22	18	21	17	29	3	6	5	0	0	0	0	121
COLUMBUS VICTORIA	P3RF8	Norfolk	21	12	21	16	19	59	71	65	60	64	0	0	408
CONTI MALACA	DGVZ	Norfolk	43	41	28	49	30	35	55	27	33	18	0	0	359
CONTSHIP ROME	ELVZ6	Norfolk	7	28	13	28	30	18	21	14	13	34	0	0	206
COSCO NORFOLK	P3ZY6	Norfolk	6	4	2	12	14	33	29	30	26	16	0	0	172
CSCL XIAMEN	A8CL6	Norfolk	10	15	28	26	0	0	0	0	0	0	0	0	79
DELAWARE BAY	WMLG	Norfolk	21	8	12	27	30	29	18	23	21	28	0	0	217
DIRECT TUI	ELVZ5	Norfolk	85	68	77	37	66	34	65	64	57	66	0	0	619
GEYSIR	WCZ5528	Norfolk	60	115	42	10	30	40	69	52	33	35	0	0	486
INDUSTRIAL CHALLENGER	WDHL	Norfolk	3	0	0	0	0	1	14	0	6	0	0	0	24
JOIDES RESOLUTION	D5BC	Norfolk	27	0	0	0	0	2	0	1	0	108	0	0	138
LEYLA KALKAVAN	TCCJ7	Norfolk	15	21	12	0	0	0	0	27	24	7	0	0	106
MAERSK MISSOURI	WAHV	Norfolk	48	39	40	18	2	20	20	0	25	10	0	0	222
MAERSK VIRGINIA	WAHK	Norfolk	0	0	0	0	2	0	0	6	0	9	0	0	17
MOL INITIATIVE	3ELL6	Norfolk	0	0	0	5	0	0	0	0	0	0	0	0	5
MSC SPAIN	DNKL	Norfolk	0	0	0	0	0	2	28	29	28	16	0	0	103
NOAA SHIP ALBATROSS IV	WMVF	Norfolk	4	69	67	70	73	14	90	68	87	140	0	0	682
NOAA SHIP NANCY FOSTER	WTER	Norfolk	0	35	12	60	53	26	55	56	69	35	0	0	401
NOAA SHIP THOMAS JEFFERS	WTEA	Norfolk	0	0	1	32	26	34	1	0	0	0	0	0	94
OOCL FORTUNE	VRWF2	Norfolk	0	0	0	13	34	39	45	34	27	42	0	0	234
ORKUN KALKAVAN	TCCG6	Norfolk	31	23	7	0	0	0	0	0	0	1	0	0	62
P&O NEDLLOYD DAMMAM	A8CA3	Norfolk	4	0	0	0	0	0	0	0	0	0	0	0	4
SEALAND COMET	MCDZ7	Norfolk	15	45	17	18	23	22	9	0	25	22	0	0	196
SEALAND FREEDOM	V7AM3	Norfolk	0	0	0	7	25	23	14	39	39	32	0	0	179
SELMA KALKAVAN	TCSX	Norfolk	21	48	36	23	19	17	42	29	40	52	0	0	327
STAR GEIRANGER	LAKQ5	Norfolk	31	34	0	33	36	0	32	31	0	35	0	0	232
STAR GRINDANGER	LAKR5	Norfolk	5	44	9	0	22	26	0	0	0	0	0	0	106
STRONG PATRIOT	WCZ8589	Norfolk	0	10	34	2	25	1	0	0	5	0	0	0	77
TAMESIS	LAOL5	Norfolk	18	13	11	0	6	0	0	0	23	10	0	0	81
Norfolk Totals:	# Ships:	37	554	773	541	584	747	664	811	704	790	945	0	0	7113
APL TURQUOISE	9VVY	Oakland	13	11	41	15	37	15	24	12	11	21	0	0	200
CHIEF GADAO	WEZD	Oakland	0	0	2	0	0	0	0	0	0	0	0	0	2
COLORADO VOYAGER	KLHZ	Oakland	13	9	1	11	13	23	14	0	3	0	0	0	87
FRANK A. SHRONTZ	C6PZ3	Oakland	9	31	4	12	8	70	0	45	26	16	0	0	221

Ship Name	Call	Port	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
GOLDEN BEAR	NMRY	Oakland	0	0	0	0	78	58	53	58	0	0	0	0	247
HORIZON ENTERPRISE	KRGB	Oakland	574	585	551	689	706	606	684	626	542	580	0	0	6143
HORIZON SPIRIT	WFLG	Oakland	66	53	54	11	37	53	68	62	67	84	0	0	555
HORIZON TRADER	KIRH	Oakland	57	62	48	48	40	33	53	63	60	57	0	0	521
LIHUE	WTST	Oakland	50	39	0	11	1	0	27	18	49	53	0	0	248
LURLINE	WLVD	Oakland	10	10	22	15	7	0	2	7	33	28	0	0	134
MADISON MAERSK	OVJB2	Oakland	44	38	38	14	32	19	53	8	13	8	0	0	267
MAERSK DAMMAM	V2OE3	Oakland	49	14	0	0	28	27	26	20	0	0	0	0	164
MAHIMAHI	WHRN	Oakland	47	40	51	60	55	29	41	46	40	42	0	0	451
MANOA	KDBG	Oakland	45	56	42	39	56	58	53	32	43	42	0	0	466
MARINE COLUMBIA	KLKZ	Oakland	62	50	65	65	56	49	54	9	20	63	0	0	493
MATSONIA	KHRC	Oakland	16	41	43	21	7	15	41	44	22	27	0	0	277
MAYVIEW MAERSK	OWEB2	Oakland	25	29	31	26	9	26	45	21	17	36	0	0	265
MOKIHANA	WNRD	Oakland	50	43	46	60	64	61	56	58	43	57	0	0	538
MOKU PAHU	WBWK	Oakland	1	31	38	46	41	16	52	34	27	41	0	0	327
MOL INNOVATION	9VVP	Oakland	24	16	16	49	29	38	25	35	22	20	0	0	274
MOL VIGOR	9VVN	Oakland	0	1	13	7	13	4	35	62	18	52	0	0	205
OOCL HONG KONG	VRVA5	Oakland	29	18	35	40	33	26	33	34	43	31	0	0	322
PHOENIX VOYAGER	C6QE3	Oakland	28	5	0	0	0	0	0	0	3	67	0	0	103
REGULUS VOYAGER	C6FE6	Oakland	0	0	35	58	42	48	3	1	24	68	0	0	279
RICHARD H MATZKE	C6FE5	Oakland	9	42	31	15	47	32	26	64	60	7	0	0	333
SEALAND CHAMPION	MCDZ2	Oakland	40	10	6	0	3	3	3	0	16	12	0	0	93
SEA-LAND DEFENDER	KGJB	Oakland	49	44	49	0	17	44	87	60	44	57	0	0	451
SEALAND INNOVATOR	WGKF	Oakland	40	48	47	61	70	54	45	61	52	49	0	0	527
SEALAND LIBERATOR	KHRP	Oakland	41	57	41	0	0	0	26	38	22	27	0	0	252
SEALAND MERCURY	MCDW9	Oakland	26	26	30	31	37	32	28	27	15	42	0	0	294
SEA-LAND PATRIOT	KHRF	Oakland	53	63	12	41	50	54	39	59	70	60	0	0	501
VIRGINIAN	KSPH	Oakland	0	20	22	48	58	34	0	59	49	53	0	0	343
WASHINGTON VOYAGER	KFDB	Oakland	1	10	5	8	5	5	0	2	0	0	0	0	36
Oakland Totals:	# Ships:	33	1471	1502	1419	1501	1679	1532	1696	1665	1454	1700	0	0	15619
A.P. MOLLER	OVYQ2	Seattle	0	44	18	0	0	0	0	0	0	0	0	0	62
APL JAPAN	S6TS	Seattle	74	99	98	95	67	104	88	112	91	95	0	0	923
APL KENNEDY	9VAY4	Seattle	53	45	36	51	70	54	72	67	49	52	0	0	549
APL SPINEL	9VVK	Seattle	0	0	24	10	0	0	70	59	65	23	0	0	251
AXEL MAERSK	OUUY2	Seattle	76	3	0	0	0	0	0	0	0	0	0	0	79
CHANG JIANG BRIDGE	3EZJ9	Seattle	56	42	48	54	36	21	63	67	49	48	0	0	484
CHARLOTTE MAERSK	OWLD2	Seattle	0	55	9	0	30	17	0	56	15	0	0	0	182
CHASTINE MAERSK	OZZB2	Seattle	0	0	57	25	0	0	0	6	0	0	0	0	88
CHEVRON LONDON	ELYX	Seattle	0	0	5	7	2	0	3	0	0	0	0	0	17
CLEMENTINE MAERSK	OUQK2	Seattle	7	0	26	6	0	17	2	0	0	0	0	0	58
COASTAL MERCHANT	WCV8696	Seattle	0	0	0	2	0	2	5	0	0	5	0	0	14
COASTAL NAVIGATOR	WCY9686	Seattle	0	2	0	0	3	5	0	0	0	0	0	0	10
COASTAL SEA	WCA7944	Seattle	0	0	3	0	3	4	0	0	0	0	0	0	10
COLUMBINE MAERSK	OUHC2	Seattle	0	65	2	0	29	0	0	0	8	9	0	0	113
CORMORANT ARROW	C6IO9	Seattle	52	25	5	27	26	23	23	5	20	14	0	0	220
CORNELIA MAERSK	OWWS2	Seattle	21	0	38	23	0	14	12	0	37	26	0	0	171
CSL CABO	D5XH	Seattle	22	19	19	28	23	19	16	10	0	0	0	0	156
EASTERN DIAMOND	HODT	Seattle	0	0	1	3	2	0	5	6	5	5	0	0	27
EOS I	P3BA7	Seattle	0	0	0	0	0	0	8	65	38	44	0	0	155
EVER GRADE	3FOW2	Seattle	18	13	15	17	15	11	12	14	11	12	0	0	138

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Ship Name	Call	Port	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
EVER ULTRA	3FEJ6	Seattle	7	3	0	0	0	0	0	0	0	0	0	0	10
EVER UNION	3FFG7	Seattle	0	0	0	8	2	0	0	0	0	7	0	0	17
EVER URANUS	3FCA9	Seattle	0	4	0	0	0	2	0	1	0	0	0	0	7
GLOIRE	3FPA6	Seattle	6	64	56	22	62	14	69	44	66	43	0	0	446
GOLDEN NOVA	3FDV6	Seattle	12	18	3	26	22	23	5	0	0	0	0	0	109
GREAT LAND	WFDP	Seattle	65	2	0	1	8	0	0	22	30	30	0	0	158
HATSU EAGLE	ZNZH6	Seattle	0	0	0	1	0	0	0	0	1	0	0	0	2
HATSU ELITE	VSJG7	Seattle	11	11	4	9	13	12	14	15	24	12	0	0	125
HATSU ENVOY	VSQL9	Seattle	51	59	23	61	68	11	0	0	0	0	0	0	273
HATSU ETHIC	VQFS4	Seattle	41	58	50	60	75	105	102	66	37	11	0	0	605
HATSU EXCEL	VSXV3	Seattle	14	20	12	13	13	14	12	5	12	7	0	0	122
HORIZON EXPEDITION	WPGJ	Seattle	0	0	0	55	19	0	0	0	7	25	0	0	106
IBIS ARROW	C6CU6	Seattle	21	30	0	0	0	0	0	0	26	31	0	0	108
ISLA DE CEDROS	VRXU2	Seattle	87	71	77	78	20	55	100	17	0	0	0	0	505
IWANUMA MARU	3ESU8	Seattle	0	0	0	0	93	0	0	0	0	0	0	0	93
KAPITAN AFANASYEV	UFIL	Seattle	0	0	0	7	61	38	22	18	21	7	0	0	174
KEISHO	3FYN4	Seattle	0	0	0	0	0	0	0	0	6	0	0	0	6
KURE	3FGN3	Seattle	22	0	0	0	0	0	0	0	13	1	0	0	36
LAKE ARU	DYZM	Seattle	0	0	0	0	0	0	0	20	0	0	0	0	20
LT UNITY	3FCD9	Seattle	3	0	2	2	0	0	0	0	0	5	0	0	12
MAERSK SUN	S6ES	Seattle	0	0	41	0	0	0	0	69	5	0	0	0	115
MAHARASHTRA	VTSQ	Seattle	0	0	17	18	3	12	10	5	13	13	0	0	91
MIDNIGHT SUN	WAHG	Seattle	48	57	30	52	43	36	48	49	140	135	0	0	638
NATHANIEL B. PALMER	WBP3210	Seattle	71	33	0	0	0	0	0	35	0	1	0	0	140
NOAA SHIP HI' IALAKAI	WTEY	Seattle	0	0	0	0	0	0	0	5	33	72	0	0	110
NOAA SHIP MCARTHUR II	WTEJ	Seattle	0	23	123	160	136	27	227	195	203	159	0	0	1253
NOAA SHIP MILLER FREEMAN	WTDM	Seattle	0	0	46	85	106	138	172	96	145	59	0	0	847
NOAA SHIP RAINIER	WTEF	Seattle	0	0	0	0	0	8	28	12	0	0	0	0	48
NORDMAX	P3YS5	Seattle	36	0	0	0	0	0	0	0	0	0	0	0	36
NORTH STAR	KIYI	Seattle	48	29	54	57	73	96	130	65	55	121	0	0	728
OOCL AMERICA	VRWE8	Seattle	0	0	0	0	0	0	0	0	0	14	0	0	14
OOCL CALIFORNIA	VRWC8	Seattle	24	28	26	38	14	20	22	33	36	13	0	0	254
ORIENTE CREST	HPFA	Seattle	0	0	5	12	0	0	0	0	0	0	0	0	17
ORIENTE GRACE	3FHT4	Seattle	0	27	39	0	0	0	0	0	0	0	0	0	66
ORIENTE NOBLE	3FVF5	Seattle	0	0	0	0	16	0	0	0	0	0	0	0	16
ORIENTE PRIME	3FOU4	Seattle	0	0	0	0	35	2	0	0	0	0	0	0	37
ORIENTE SHINE	H9AL	Seattle	0	21	10	6	0	0	0	0	7	24	0	0	68
ORIENTE VICTORIA	3FVG8	Seattle	0	24	17	0	0	0	0	61	25	48	0	0	175
PENANG SENATOR	DQVH	Seattle	51	29	67	73	54	45	36	19	42	5	0	0	421
PRESIDENT ADAMS	WRYW	Seattle	55	115	74	65	51	109	60	116	93	77	0	0	815
PRESIDENT JACKSON	WRYC	Seattle	81	56	30	85	52	45	42	28	43	39	0	0	501
PRESIDENT POLK	WRYD	Seattle	61	152	51	42	24	105	88	69	115	39	0	0	746
PRESIDENT TRUMAN	WNDP	Seattle	66	51	29	62	67	31	67	47	50	53	0	0	523
PUSAN SENATOR	DQVG	Seattle	24	33	13	8	14	1	23	27	12	16	0	0	171
RUBIN ARTEMIS	3FAH7	Seattle	29	33	17	18	22	17	35	35	36	14	0	0	256
RUBIN PEARL	YJQA8	Seattle	0	27	70	54	36	47	40	74	23	81	0	0	452
SALLY MAERSK	OZHS2	Seattle	57	0	2	86	0	0	34	17	0	9	0	0	205
SANTA BARBARA	ELOT3	Seattle	40	21	25	17	27	15	20	20	26	28	0	0	239
SEALAND LIGHTING	S6EA	Seattle	0	0	0	0	0	0	0	0	0	17	0	0	17
SHIRAOI MARU	3ECM7	Seattle	0	0	0	0	0	13	0	0	0	0	0	0	13
SINE MAERSK	OZOK2	Seattle	0	40	0	8	34	0	0	0	17	0	0	0	99

Ship Name	Call	Port	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
SKAUGRAN	LADB2	Seattle	18	48	42	65	10	0	4	14	3	7	0	0	211
SOFIE MAERSK	OZUN2	Seattle	0	0	0	43	19	0	21	11	0	0	0	0	94
SOROE MAERSK	OYKJ2	Seattle	37	28	0	0	25	10	0	13	10	0	0	0	123
SOVEREIGN MAERSK	OYGA2	Seattle	0	0	0	15	21	0	40	24	0	0	0	0	100
STAR DOVER	LAEP4	Seattle	43	0	0	42	0	30	28	0	28	1	0	0	172
STELLAR VOYAGER	C6FV4	Seattle	0	9	35	33	17	21	2	11	15	0	0	0	143
SUSAN MAERSK	OYIK2	Seattle	2	0	6	1	0	8	9	0	32	25	0	0	83
SVEND MAERSK	OYJS2	Seattle	0	0	0	25	1	0	52	43	5	0	0	0	126
SVENDBORG MAERSK	OZSK2	Seattle	0	19	27	0	13	37	0	0	0	0	0	0	96
THOMAS G. THOMPSON	KTDQ	Seattle	0	20	20	30	40	20	20	0	0	0	0	0	150
UBC SAIKI	P3GY9	Seattle	4	41	50	39	22	21	18	76	49	48	0	0	368
UBC SVEA	P3JA8	Seattle	0	0	0	0	0	0	0	0	12	65	0	0	77
UNITED SPIRIT	ELYB2	Seattle	70	87	66	96	84	71	63	0	37	62	0	0	636
USCGC HEALY	NEPP	Seattle	0	0	2	5	143	119	71	40	75	116	0	0	571
USCGC MIDGETT (WHEC 726)	NHWR	Seattle	0	0	0	0	0	23	9	0	0	0	0	0	32
USCGC POLAR SEA	NRUO	Seattle	62	64	4	0	0	0	0	0	0	1	0	0	131
USCGC POLAR STAR	NBTM	Seattle	114	89	131	52	0	0	0	0	0	0	0	0	386
VLADIVOSTOK	UBXP	Seattle	41	59	71	61	57	49	23	20	23	38	0	0	442
WECOMA	WSD7079	Seattle	0	28	4	4	78	89	77	74	71	31	0	0	456
WESTWARD VENTURE	KHJB	Seattle	0	0	13	9	26	0	0	0	0	0	0	0	48
WESTWOOD ANETTE	C6QO9	Seattle	30	7	3	4	21	13	17	2	16	1	0	0	114
WESTWOOD BORG	LAON4	Seattle	72	73	48	64	61	31	42	0	0	0	0	0	391
WESTWOOD BREEZE	LAOT4	Seattle	46	14	21	8	12	7	0	0	0	0	0	0	108
WESTWOOD COLUMBIA	C6SI4	Seattle	38	38	24	27	20	25	27	42	43	25	0	0	309
WESTWOOD MARIANNE	C6QD3	Seattle	63	45	42	69	52	48	65	79	0	72	0	0	535
WESTWOOD RAINIER	C6SI3	Seattle	56	24	27	11	48	37	41	40	17	12	0	0	313
WESTWOOD VICTORIA	C6SI6	Seattle	49	41	41	41	39	69	72	63	41	42	0	0	498
WORLD SPIRIT	ELWG7	Seattle	22	60	49	21	37	29	42	42	55	49	0	0	406
Seattle Totals:	# Ships:	99	2177	2345	2143	2402	2415	2089	2528	2346	2282	2144	0	0	22871
ALERT	WCZ7335	Valdez	0	0	0	0	0	0	0	3	1	23	0	0	27
ATTENTIVE	WCZ7337	Valdez	0	0	0	0	0	0	0	0	1	10	0	0	11
AWARE	WCZ7336	Valdez	0	0	0	0	0	0	6	6	4	6	0	0	22
BULWARK	WBN4113	Valdez	0	0	0	0	0	0	22	21	0	4	0	0	47
ENDURANCE	WDA3359	Valdez	0	0	0	0	0	0	0	31	43	0	0	0	74
PATHFINDER	WBN8467	Valdez	0	0	0	0	0	0	13	3	0	10	0	0	26
POLAR ALASKA	KSBK	Valdez	27	9	21	9	7	9	5	0	22	56	0	0	165
POLAR TEXAS	KNFD	Valdez	21	31	27	11	9	18	39	10	8	26	0	0	200
PRINCE WILLIAM SOUND	WSDX	Valdez	0	0	0	0	9	8	4	4	4	0	0	0	29
SEA VOYAGER	WCX9106	Valdez	0	0	0	0	0	0	33	52	43	39	0	0	167
SEARIVER BAYTOWN	KFPM	Valdez	0	0	0	0	0	0	2	1	1	0	0	0	4
Valdez Totals:	# Ships:	11	48	40	48	20	25	35	124	131	127	174	0	0	772

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
TOTAL SHIPS: 707	13170	13659	13886	14824	15702	14531	17116	17464	17139	18029	0	0	155500

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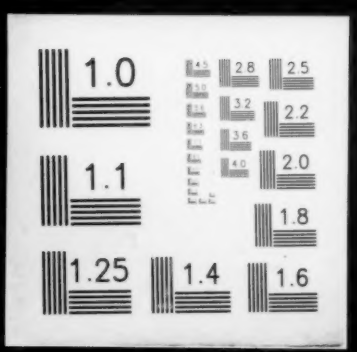
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